

November 2008

Draft Environmental Assessment

Proposed Interim Operating Criteria for 8.5 Square Mile Area Project Miami-Dade County, Florida



U.S. Army Corps
of Engineers
Jacksonville District

DRAFT FINDING OF NO SIGNIFICANT IMPACT
Proposed Interim Operating Criteria for
8.5 Square Mile Area Project
Miami-Dade County, Florida

The U.S. Army Corps of Engineers, Jacksonville District, is proposing interim operating criteria for the 8.5 Square Mile Area (SMA) Project. The proposed operating criteria define when the S-357 Pump Station will be run and also allow for some flexibility in the operation of the S-331 Pump Station. This plan is the best balance between flood mitigation for the 8.5 SMA residents and environmental protection. The 8.5 SMA project is a feature of the Modified Water Deliveries Project final recommended plan, described in the July 2000 *General Reevaluation Report and Final Supplemental Environmental Impact Statement, 8.5 Square Mile Area*.

The Recommended Plan, equivalent to the Preferred Alternative in National Environmental Policy Act (NEPA) language, is to operate the S-357 pump station with a limitation on pumping capacity of 500 acre feet per day and allow operational flexibility for the S-331 pump station as described in Alternative B of the Environmental Assessment (EA).

I have reviewed the EA for the proposed action. Based on information analyzed in the EA, reflecting pertinent information obtained from agencies having jurisdiction by law and/or special expertise, I conclude that the proposed action will not significantly impact the quality of the human environment and does not require an Environmental Impact Statement. Reasons for this conclusion are in summary that the proposed action:

- a. Will not affect the level of flood risk for residents of the 8.5 SMA nor surrounding lands.
- b. Will not adversely affect the overall existing fish and wildlife habitat, including that of Federal and State-listed endangered and threatened species.
- c. Will not adversely affect water quality and will be in compliance with appropriate conditions in the State Water Quality Certification.
- d. Will not substantially alter any other environmental or social impacts from those previously described in the 2000 *General Reevaluation Report and Final Supplemental Environmental Impact Statement, 8.5 Square Mile Area* or other National Environmental Policy Act compliance documents.
- e. Will meet the authorized purposes of the Modified Water Deliveries to Everglades National Park Project and will not adversely affect the authorized purposes of the Central and Southern Florida Project.

This Finding incorporates by reference all discussions and conclusions contained in the Environmental Assessment enclosed hereto.

Paul L. Grosskruger
Colonel, U.S. Army
District Commander

Date

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Executive Summary

Project Overview

The 8.5 Square Mile Area Project (8.5 SMA) is a part of the Modified Water Deliveries (MWD) to Everglades National Park (ENP) Project, authorized in the 2000 Water Resources Development Act (WRDA) and reauthorized specifically by the U.S. Congress in the 2003 Appropriations Act. MWD consists of four main components: (1) flood mitigation for the 8.5 SMA which is an area directly adjacent to ENP; (2) conveyance and seepage control features (CSCF) to facilitate flow through the system from WCA-3A to WCA-3B and limit seepage eastward from WCA-3B and ENP; (3) modifications to the Tamiami Trail (TTM) to facilitate flow under the road; and (4) project implementation support, which includes monitoring and operational changes (known as the Combined Operational Plan, COP). All four components are necessary and work together to restore flows from WCA-3A to WCA-3B under Tamiami Trail to the historic headwaters of the NESRS in the Everglades Expansion Area.

MWD project's features are additions to the overall Central and Southern Florida Project (C&SF) providing wetlands restoration, flood damage mitigation, water supply and recreation to the residents and natural ecosystems of south Florida. The 8.5 SMA was the most extensively subdivided and residential area located to the west of the L-31N Levee in the Eastern Everglades, and it was anticipated in the 2000 8.5 SMA General Reevaluation Report (GRR) and Environmental Impact Statement (EIS) that seepage control and flood damage mitigation features, as well as some relocations, would be necessary in order to allow all remaining residents to live in decent, safe and sanitary conditions. Per the July 2000 GRR/Final Supplemental EIS final recommended plan, known as Alternative 6D, major features of the 8.5 SMA Project include a perimeter levee, internal levees, a seepage collection canal, pump station (S-357) and a flow-way leading to a detention cell. At present, residential relocations have been completed, lands have been cleaned of potentially hazardous or toxic materials, levee and seepage canal features as well as the pump station and detention area have been built, and the U.S. Army Corps of Engineers (USACE) and local sponsor, South Florida Water Management District (SFWMD) are ready to begin operations.

USACE has evaluated alternatives for the 8.5 SMA Project Proposed Interim Operating Criteria. The 8.5 SMA features are designed to mitigate for the increased flood risk associated with the planned increased water levels in ENP due to implementation of future MWD components. The proposed water management operating criteria in this report are interim and subject to change prior to completion of the ongoing long-term construction of the MWD Project and the C-111 Project. The 8.5 SMA Project features will work in conjunction

with the existing S-331 pump station which is the flood control structure for the immediate area.

The objective of the proposed interim operating criteria is to maintain the surface and groundwater levels between L-357W and L-31N (within the 8.5 SMA) at the same levels expected prior to the implementation of any MWD components, while preserving hydroperiods near the 8.5 SMA.

After reviewing and analyzing the impacts of the alternatives, USACE tentatively recommends Alternative B – S-357 Operations with Pumping Capacity Limitation and S-331 Operational Flexibility. The proposed operating criteria define when S-357 Pump Station will be run and also allow for some flexibility in the operation of S-331. This plan is the best balance between flood mitigation for the 8.5 SMA residents and environmental protection.

Operations of the C&SF project in the project area, except for S-357, are currently governed by the *2006 Interim Operating Plan (IOP) for the Protection of the Cape Sable Seaside Sparrow Final Supplemental Environmental Impact Statement*. The Proposed Interim Operating Criteria for the 8.5 SMA Project components would be incorporated into IOP. The S-357 Pump Station and associated features will work in conjunction with IOP until the full system operating plan is finalized.

Plan Selection

The alternatives considered are listed below:

Alternative A – No action

Alternative B – S-357 Operations with Pumping Capacity Limitation and S-331 Operational Flexibility

Alternative C – S-357 Operations with No Pumping Capacity Limitation and S-331 Trigger Gage Changed to Las Palmas

Alternative D – S-357 Operations With No Pumping Capacity Limitation, S-356 Operations, S-331 Trigger Gage Changed to Las Palmas, Raising G-3273 Constraint and Modifying L-29 Borrow Canal Constraint

Alternative E – S-357 Operations as Described in the July 2000 FSEIS – No Limitation on Detention Cell Overflow

Alternative D was eliminated from detailed analysis due to public and agency comments and issues (refer to discussion in **Section 2.4** and detailed public and agency comments in **Section 6**). Alternative D would be a much larger operations plan, incorporating regional operational changes which were not required to address the objective of the proposed interim operating criteria. It would require modifications to IOP, extensive coordination and a more detailed analysis. As there is a strong desire to run the S-357 pump station as soon as

possible, this was not a reasonable alternative. Alternative E was eliminated due to the potential for untreated water to overflow the detention cell before construction of the C-111 Northern Detention Area is completed, possibly leading to direct surface water flow of untreated water into ENP. After reviewing the potential impacts (**Section 4**), Alternative B was chosen as the Recommended Plan. The Recommended Plan best ensures that waters discharged from the 8.5 SMA meet water quality standards while also providing flood mitigation to 8.5 SMA residents in a manner consistent with the authorized purposes of the MWD and Canal-111 South Dade Projects. Alternative B also provides environmental benefits including less seepage from ENP to the 8.5 SMA (compared to existing conditions) and more pumping flexibility resulting in a potential decrease in pump operations at S-331.

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1.0 PROJECT PURPOSE AND NEED

This document describes the evaluation of alternatives considered for the Proposed Interim Operating Criteria for the MWD 8.5 SMA Project. The 8.5 SMA Project features are designed to mitigate for increased flood risk as a result of increased water levels in NESRS and other area of ENP due to future implementation of MWD Tamiami Trail Modifications and Conveyance and Seepage Control Features.

The objective of the proposed interim operating criteria is to maintain the surface and groundwater levels between L-357W and L-31N (within the 8.5 SMA) at the same levels expected prior to the implementation of any MWD Project components, while preserving hydroperiods near the 8.5 SMA.

Proposed Interim Operating Criteria for the 8.5 SMA Project are needed to ensure that the water volume that can be retained within the detention cell (in past documents referred to as an STA) would not be exceeded for the period of time prior to completion of the Canal-111 South Dade (C-111) Project Northern Detention Area (NDA) and associated weirs and levees. Once the C-111 NDA is complete, the water could then be released south into a detention area in the C-111 Project area south of the 8.5 SMA detention cell (L-359). See *Figure 1-1* and *Figure 1-2*, maps of the project area and project features.

The water management operating criteria proposed are interim and are subject to change prior to completion of the ongoing long-term construction of the MWD Project and the C-111 Project. The 8.5 SMA Project features will work in conjunction with the existing S-331 pump station which is the flood control structure for the immediate area.

Interim operations of the 8.5 SMA Project were not adequately considered in previous National Environmental Policy Act (NEPA) documents prepared by U.S. Army Corps of Engineers (USACE). Consequently, this Environmental Assessment (EA) was prepared to meet NEPA requirements and ensure that USACE is in compliance with environmental regulations. Additionally, this EA provides information on minor changes that were made to the 8.5 SMA Project from the description provided in the 2000 FSEIS, as well as providing an update on existing conditions of the study area.

1.1 PROJECT BACKGROUND AND HISTORY

MWD to ENP modifies the Central and South Florida (C&SF) Flood Control Project authorized in 1962 and 1968. The C&SF Project consists of an extensive array of levees, canals, and water control structures that cover the Florida Peninsula south of Lake Okeechobee. MWD consists of four main components: (1) flood mitigation for the 8.5 SMA which is an area directly adjacent to ENP;

(2) conveyance and seepage control features (CSCF) to facilitate flow through the system from WCA-3A to WCA-3B and limit seepage eastward from WCA-3B and ENP; (3) modifications to the Tamiami Trail to facilitate flow under the road; and (4) project implementation support, which includes monitoring and operational changes. All four components are necessary and work together to restore flows from WCA-3A to WCA-3B under Tamiami Trail to the historic headwaters of the NESRS in the Everglades Expansion Area.

The 8.5 SMA is an inhabited residential and agricultural area bounded on the west by the ENP, and separated from more intensively developed urban lands to the east by the L-31N flood protection levee and borrow canal. The overall purpose of the MWD project is to restore natural hydrologic (water) conditions in ENP, which was altered by the construction of roads, levees, and canals. The specific directive relative to the 8.5 SMA was to build a flood mitigation project for the residential areas in the East Everglades that were going to be adversely affected by the increasing water deliveries due to the MWD Project. In addition to the 8.5 SMA Project, the following features have been completed: construction of the S-355 A and B, S-333 approach slabs, S-356, S-334 modifications, Tiger Tail camp raising, and removal of 4 miles of the L-67 extension. The following MWD construction remains: Tamiami Trail modifications; S-349 A, B, and C; S-345 A, B, and C; degrading of L-67 C in three areas; Osceola Camp raising, and remaining degrade of L-67 extension. An overall combined operational plan (COP, formerly known as CSOP) for the completed C-111 and MWD projects is being developed.

The Everglades National Park Protection and Expansion Act, December 1989, authorized the Secretary of the Army to improve water deliveries to ENP and to take steps to restore natural hydrologic conditions to the extent practicable. The MWD General Design Memorandum (GDM) called for in the Act was completed in June 1992. The authorized purpose of the 8.5 SMA component of the MWD project is to provide a flood mitigation system for the 8.5 SMA. In 1992, a flood mitigation plan was approved for the 8.5 SMA to allow for restoration of the NESRS as authorized by the MWD Project. The July 2000 *General Reevaluation Report (GRR) and Final Supplemental Environmental Impact Statement (FSEIS)*, *8.5 Square Mile Area* modified the alignment of the canal, levee, and pump station from the original plan in the 1992 GDM. The project features are described in detail in **Appendix E** of this report. This 8.5 SMA flood mitigation system was designed to mitigate for any increase in flooding that might result from higher stages associated with the MWD Project.

Operations in the project area are currently governed by the *2006 Interim Operating Plan (IOP) for the Protection of the Cape Sable Seaside Sparrow Final Supplemental Environmental Impact Statement*. The Proposed Interim

Operating Criteria for 8.5 SMA Project would work in conjunction with IOP until a new operations plan is developed.

A preliminary operating plan for 8.5 SMA was presented in the July 2000 8.5 Square Mile Area GRR/FSEIS. Construction of S-357 Pump Station, seepage canal, levees, and detention cell was physically complete on May 30, 2008. Testing of the S-357 Pump Station occurred in February 2008 and again in April 2008. Expansion of the C-111 Project NDA and construction of weirs and levees that would receive and treat waters drained from the detention cell are scheduled to be complete in June 2011. Expansion of the NDA and construction of levees and weirs for the C-111 Project is described in the June 2007 *Draft Environmental Assessment; Design Modifications for the Canal 111 (C-111) Project Miami-Dade County, Florida*.

1.2 CHANGES SINCE THE 2000 GRR/FSEIS

Several design updates to the 2000 GRR/FSEIS have been made since initial preparation of the document. These changes are consistent with the purpose of the recommended plan.

1) The GRR/FSEIS stated that water would be discharged from S-357 Pump Station through a 2,000 foot 96 inch pipe. This water would then flow into a 200 acre treatment facility, which this report refers to as a detention cell that is located 2,000 feet south of Richmond Drive on C-111 project lands, previously purchased for the C-111 buffer area. The detention cell consists of a bermed area approximately 3,000 feet by 3,000 feet. During design, the detention cell configuration was changed to include a 300 foot flowway in place of a 96 inch pipe. There is a weir at the end of the flowway. The flowway weir elevation is 9.5 feet National Geodetic Vertical Datum (NGVD). This is approximately 2.5 feet above grade. The 8.5 SMA detention cell is in the shape of a parallelogram. This shape allowed for the detention cell to be located the greatest distance possible from the L-31N Canal, and for a tree island to be avoided. Groundwater seepage in the area flows predominantly toward the L-31 N Canal. The levees that form the flowway and detention cell have a 12 foot crown width with 1 Vertical on 4 Horizontal side slopes and a top elevation of 13 ft NGVD. The levees were constructed out of rock plowed material scraped from the detention cell to prevent exotic growth. The depth of material varies in the area from one to seven inches. The levees were capped with material from the L-31 N Spoil Mound located adjacent to S-331.

2) Although the GRR/FSEIS stated that water would discharge from the 96 inch pipe into a treatment area, very little information was provided for the treatment area design. Two 350-foot concrete overflow weirs are located on the south side of the detention cell: the east weir is at elevation 10.5 feet, and the west weir is at elevation 11 feet. The weirs are 3.5 and 4 feet above grade,

respectively. Once the C-111 NDA is completed, the discharge from the detention cell will flow over these two passive overflow weirs. The detention cell overflow weirs will then have crest elevations of 1.25 (lowered crest elevation) and 4 feet above grade on the east and west sides, respectively. The eastern weir will discharge into the C-111 NDA flowway to complete the hydraulic ridge. The western weir will only discharge if the detention cell reaches an elevation of four feet. Once the C-111 Project NDA is completed, the eastern weir would be lowered to allow discharge out of the detention cell.

3) The S-357 Pump Station was originally located north of 168th Street (Richmond Drive). During the pre-design phase the S-357 Pump Station was relocated south of Richmond Drive on C-111 lands. These lands were purchased by the MWD Project.

4) There have been several minor shifts in alignment of the perimeter levee and seepage canal since the 2000 GRR/FEIS. Final perimeter levee alignment was coordinated with the residents of the 8.5 SMA and this design was carried into construction. The alignment was changed during construction at 208th Street. Nine hundred and fifty feet of the levee was relocated 250 feet west of the east side of 208th Street.

After design began, a section of the seepage canal was removed from the contract. The section removed is located at the north end of the seepage canal from Station 10+00 to 19+00. The principal reason for shortening was belief that the nearby L-31 Canal would provide drainage to this eastern end of the lands. The seepage canal was realigned to provide a better transition through the bends and to shorten the culvert length at 136th Street or Howard Drive.

5) A culvert crossing for the seepage canal was added within the originally proposed footprint at 199th Avenue just north of Howard Drive. The purpose of the crossing was to continue to allow residents of the 8.5 SMA road access to the area.

1.3 RELATED DOCUMENTS

The USACE has documented a number of actions relevant to the proposed action:

- *General Reevaluation Report (GRR) and Final Supplemental Environmental Impact Statement (FSEIS), 8.5 Square Mile Area*, U.S. Army Corps of Engineers. July 2000
- *General Design Memorandum (GDM) and Environmental Impact Statement (EIS), Modified Water Deliveries to Everglades National Park*, U.S. Army Corps of Engineers June 1992

- *Interim Operating Plan (IOP) for the Protection of the Cape Sable Seaside Sparrow Final Supplemental Environmental Impact Statement*, U.S. Army Corps of Engineers December 2006
- *Draft Environmental Assessment; Design Modifications for the Canal 111 (C-111) Project Miami-Dade County, Florida*, U.S. Army Corps of Engineers June 2007
- *C-111 General Reevaluation Report and Supplemental Environmental Impact Statement*, U.S. Army Corps of Engineers 1994
- *C-111 Engineering Documentation Report*, U.S. Army Corps of Engineers May 2007
- *Canal (C-111), Central and Southern Florida Project for Flood Control and Other Purposes, Final GRR and Environmental Impact Statement, Dade County, Florida*. Jacksonville District, Jacksonville, Florida. U.S. Army Corps of Engineers. 1994.
- *Biological Opinion, Final Interim Operating Plan (IOP)*, U.S. Fish and Wildlife Service, November 16, 2006.

Information contained in previous NEPA documents listed above, as well as others described later, is incorporated by reference into this EA. These NEPA documents can be accessed via the internet from the USACE, Jacksonville District website (<http://www.saj.usace.army.mil/dp/mwdenp-c111/index.htm>).

1.4 PROJECT AUTHORITY

The purpose of the Everglades National Park Protection and Expansion Act of 1989 (P.L. 101-229) was "To modify the boundaries of the Everglades National Park and to provide for the protection of lands, waters, and natural resources within the park, and for other purposes". Public Law 101-229 (101st Congress) was approved on December 13, 1989. This act also authorized the Secretary of the Army, upon completion of a General Design Memorandum (GDM), to modify the Central and Southern Florida Project to improve water deliveries to the park and to the extent practicable permit steps to restore the natural hydrology within the park. The Public Law (PL) for MWD to ENP Project (PL 101-229) was amended as PL 108-7 (Appropriations Act, 2003). This authorization bill identified Alternative 6D (the Selected Alternative in the GRR) as the plan to be built, authorized relocation of residents, and other provisions.

When USACE completed the GDM for MWD in 1992, the operational plan identified in the GDM was not considered final. The recommended plan was selected on the basis of expected environmental benefits derived from a modified water delivery schedule. The GDM called for hydrologic modeling, coordination of modeling results, and environmental evaluations to develop an acceptable water control plan. The GDM also recognized that review and adjustment of project operations would continue as experience and additional assessment of data revealed potential for improvement.

Based on concerns of the U.S Fish and Wildlife Service regarding the status of the endangered Cape Sable seaside sparrow (CSSS) a series of emergency tests were authorized to allow USACE to conduct water control operations to protect the CSSS. During these emergency tests, USACE initiated two interim operational plans for the benefit of the Cape Sable seaside sparrow, while preserving other C&SF project purposes. The initial plan adopted by USACE was referred to as the Interim Structural and Operational Plan (ISOP) and was replaced by the current plan, the Interim Operational Plan (IOP). An EA was completed March 2000 for ISOP, an FEIS was completed for IOP May 2002 and an FSEIS Interim Operational Plan (IOP) for Protection of the Cape Sable Seaside Sparrow was completed December 2006.

1.5 PROJECT LOCATION

The 8.5 SMA lies within a region commonly referred to as the Rocky Glades, occupying the western slope of the Atlantic Coastal Ridge. Prior to construction the 8.5 SMA encompassed approximately ten square miles of mixed use development in South Miami-Dade Counties, South Florida. It is bounded on the west and north by a protective levee approximately seven miles in length, on the north by SW 104th Street, on the south by SW 168th Street (Richmond Drive), and separated from more intensively developed urban lands to the east by the L-31N flood protection levee and borrow canal. The 8.5 SMA is located in the East Everglades, approximately 20 miles southwest of Miami, approximately ten miles north of Homestead, and 6.6 miles south of U.S. Highway 41 (Tamiami Trail). The 8.5 SMA is bounded roughly on the west and north by NESRS, on the south by the Taylor Slough headwaters and on the east by the urban and agricultural areas east of L-31N (*Figure 1-1*).

S-357 Pump Station is located south of Richmond Drive between SW 205th and SW 206th Avenues, approximately three miles west of Krome Avenue. S-357 Pump Station lies at the southern end of the seepage collection canal that drains water from the 8.5 SMA. The S-357 Pump Station and the 8.5 SMA detention cell are located within C-111 Project lands south of Richmond Drive. The detention cell lies 2,000 feet south of 168th Street and is approximately one half mile from S-357 Pump Station (*Figure 1-2*). Under the C-111 Project, L31W and S-332D levees will be extended to the 8.5 SMA. This extension is known as the C-111 NDA. The purpose of the C-111 NDA is to provide a hydraulic ridge which utilizes water from the C-111 pump stations to hydrate ENP. C-111 Project lands shall receive discharge waters from the 8.5 SMA detention cell. ENP bounds the C-111 Project on the west. Construction is projected to begin on these C-111 project features in 2010. S-331 Pump Station is an existing component of the C-111 Project located east of S-357 on L31N Canal and North of 168th Street. S-331 is being upgraded by the addition of a command and control building, a new radio tower, and a radio tower control building. S-331 discharges water into L-31N Canal. The discharged water then flows to the south in L-31N Canal.



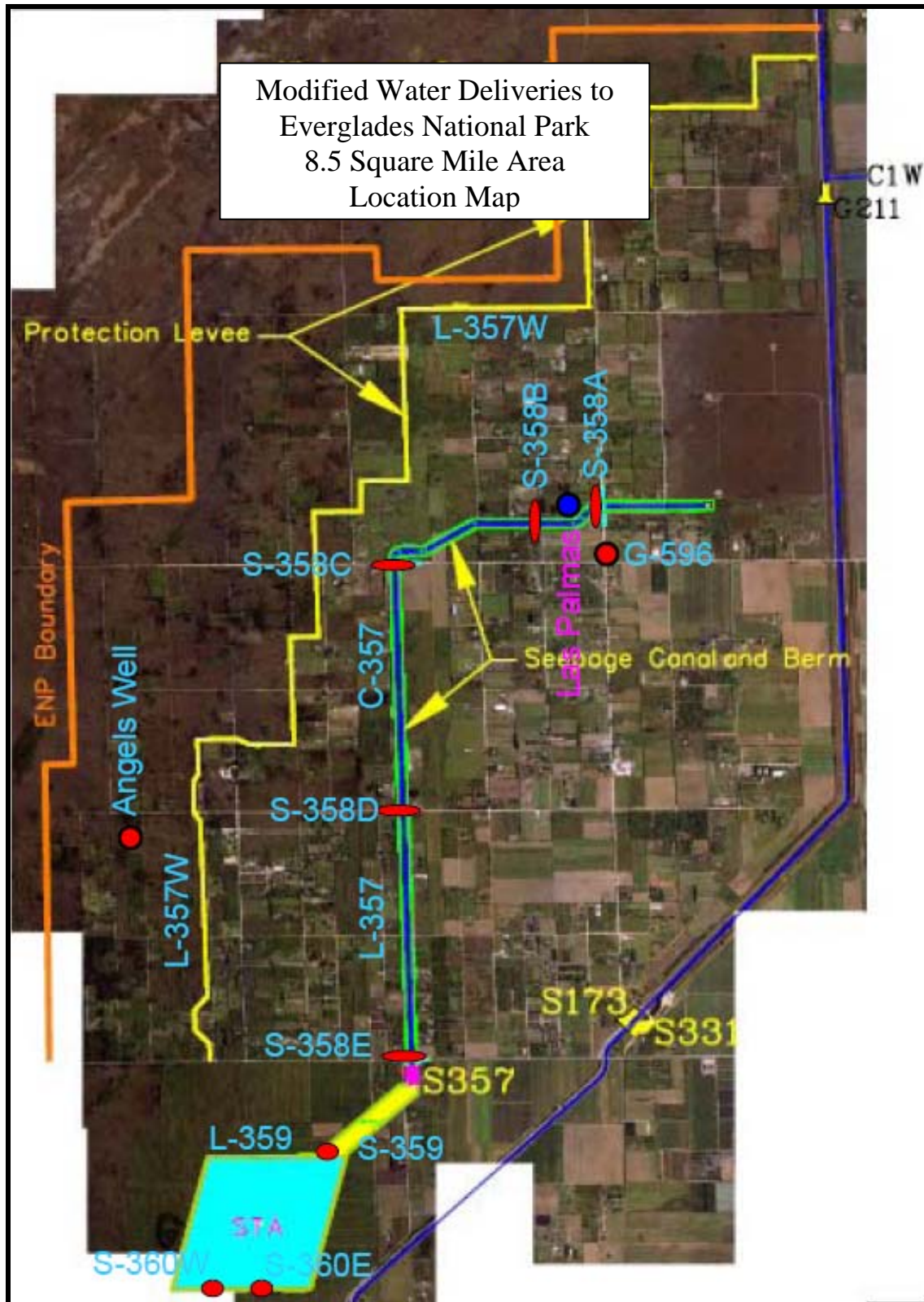


FIGURE 1-2: PROJECT FEATURES MAP

1.6 DECISIONS TO BE MADE

The adoption of a Recommended Plan for the Proposed Interim Operating Criteria for the 8.5 SMA Project is the primary decision that must be made. Alternative B has been identified as the Recommended Plan of operations for the 8.5 SMA.

1.7 SCOPING AND ISSUES

A public meeting was held on January 31, 2008 in Miami, Florida to discuss the Preliminary Draft Proposed Interim Operating Criteria for 8.5 SMA project features. Public and agency comments were accepted on the Draft Proposed Interim Operating Criteria for 8.5 SMA Project features until March 3, 2008. The full public and agency comments received are included in Appendix B and a matrix of the comments and responses are included in **Section 6.4**. The comments received were compiled and discussed at an inter-agency sub-team meeting held on April 25, 2008 which included ENP, FWS, USACE, the Miccosukee Tribe, Florida Department of Agriculture and Consumer Services (FDACS), and SFWMD.

The major issues raised during scoping were:

- Potential to over-drain ENP
- Operations of S-356
- Intent of future operations (COP)
- Flood protection versus flood mitigation for 8.5 SMA residents
- Relation of G-3273 constraint to these operations
- Relation of L-29 elevations to these operations
- Potential impact to nearby wetlands

As a result of scoping and the inter-agency sub-team meeting held in April, 2008, many of the original and more controversial components proposed as part of the plan were removed including operations for S-356, modifications to G-3273 constraint, and modifications to L-29 Borrow Canal constraint.

1.8 PERMITS, LICENSES, AND ENTITLEMENTS

USACE has applied to and received all required permits (associated with the diesel powered pump station) from the Environmental Protection Agency (EPA) delegated authorities (Miami-Dade County Department of Environmental Resources Management [DERM] and Florida Department of Environmental Protection [FDEP]) with Clean Air Act responsibilities. In addition, USACE has applied for and received 401 Water Quality Certification (WQC) from the FDEP for the construction of this pump station. USACE will apply to FDEP for the 401 WQC to operate this pump station. A water quality monitoring plan for start up operations of this pump station has already been coordinated with FDEP and has preliminary approval. Final approval of this plan will be granted when the operations permit is issued. USACE has received a variance from

DERM that allows the fuel tanks and drinking water well to be located on this job site. USACE has applied for and received a drinking water well construction permit from the Florida Department of Health. SFWMD has been granted a consumptive use permit for this well. USACE will apply for and receive any other permits required by the local authorities (any clean water, drinking water or clean air act related permits). The U.S. Fish and Wildlife Service (FWS) ecosystem risk group has provided their preliminary concurrence to operate this feature (copper bearing soils concern). Final approval from the FWS ecosystem group will be provided in their acceptance of the USACE report on this matter.

2.0 ALTERNATIVES

2.1 DESCRIPTION OF ALTERNATIVES

The alternatives described below were each considered as the Proposed Interim Operating Criteria for 8.5 SMA Project was developed. Existing operations in the project area are currently governed by an IOP (2006 *Interim Operating Plan for the Protection of the Cape Sable Seaside Sparrow Final Supplemental Environmental Impact Statement*). The Proposed Interim Operating Criteria for 8.5 SMA Project would work in conjunction with IOP. These interim operations are needed to mitigate for MWD components that have been constructed until MWD flows occur. Once MWD flows are available, system operations will be redefined.

2.1.1 ALTERNATIVE A - NO ACTION

Alternative A is the no action plan. This alternative would continue current IOP operations without use of 8.5 SMA Project features. All structures included in the IOP would operate as currently defined in that plan.

2.1.2 ALTERNATIVE B – S-357 OPERATIONS WITH PUMPING CAPACITY LIMITATION AND S-331 OPERATIONAL FLEXIBILITY

S-357 Pump Station would be operated in conjunction with the existing S-331 Pump Station as defined in the bullets below. The capacity of the S-357 pump station would be limited to a maximum of 500 acre-feet per day. Under this alternative overflow events from the 8.5 SMA detention cell would not be allowed (due to the C-111 NDA not being complete). The structures S-360W and S-360E are the southern passive weirs controlling discharge from the detention cell. The S-357 Pump Station would be shut down when stages within the southern part of the detention cell are within 0.5 feet of the crest of the S-360E passive weir. For more information on this alternative please see the Proposed Interim Operating Criteria for 8.5 SMA Project in **Appendix C**.

Proposed operations include:

- The G-3273 gage defines "wet and dry" conditions as greater than or less than 6.8 feet (NGVD), respectively.
- During "wet" conditions, S-357 Pump Station may be operated up to 500 acre-feet per day to maintain C-357 at the Las Palmas gage between 5.2 and 4.9 feet, NGVD. The pump(s) will be off when the Las Palmas gage is less than 4.9 feet, NGVD.
- During "dry" conditions, S-357 may be operated up to 500 acre-feet per day to maintain C-357 at the Las Palmas gage between 5.7 and 5.4 feet, NGVD. The pump(s) will be off when the Las Palmas gage is less than 5.4 feet, NGVD.

- Angel's Well is currently referenced for S-331 flood control operations, however during this interim period, the Las Palmas gage can also be considered in the determination of S-331 flood control operations.
 - Existing S-331 operations include the ability to make WCA-3 regulatory releases to the South Dade Conveyance System, if permitted by downstream conditions (existing S-331 off criteria). This includes conveying water from S-334 (excess water from WCA-3), the ability to convey excess water from the L-30 Canal via S-335, the ability to convey excess water from L-31N between S-335 and G-211 (S-336 closed or discharging east), or a combination of these sources for low S-332B and S-332C pumping rate (125 cfs or less per pump station).
 - If Angel's well or the Las Palmas gage is between elevations 5.5 and 6.0 feet the average daily water level upstream of S-331 may be maintained between elevations 4.5 feet and 5.0 feet if permitted by downstream conditions.
 - If Angel's Well or the Las Palmas gage is above elevation 6.0 feet the average daily water level upstream of S-331 will be maintained between elevations 4.0 feet and 4.5 feet, if permitted by downstream conditions (existing S-331 off criteria).
 - If pumping (500 acre feet per day) at S-357 does not effectively lower Las Palmas water level and/or detention cell water level is causing pumping to cease at S-357, Angels Well criteria (per IOP) will be followed for S-331 pumping.

2.1.3 ALTERNATIVE C – S-357 OPERATIONS WITH NO PUMPING CAPACITY LIMITATION AND S-331 TRIGGER GAGE CHANGED TO LAS PALMAS

Alternative C would have the same trigger operations for S-357 as proposed in Alternative B above. There would be no pumping capacity limitation. This would allow the maximum cubic feet per second (cfs) of the pump station until the 8.5 SMA detention cell is within 0.5 feet of the crest of the S-360E passive weir, at which point the pump would be shut down. The S-331 trigger gage would change from Angel's Well, which is used under current operations, to the Las Palmas gage, which is located in the interior of the 8.5 SMA levee. This is different from Alternative B which uses Angel's Well and the Las Palmas gage in combination to determine S-331 pump operations. Alternative C represents the scenario that was modeled using the MODBRANCH model as described below in Section 2.2.

2.1.4 ALTERNATIVE D – S-357 OPERATIONS WITH NO PUMPING CAPACITY LIMITATION, S-356 OPERATIONS, S-331 TRIGGER GAGE CHANGED TO LAS PALMAS, RAISING G-3273 CONSTRAINT AND MODIFYING L-29 BORROW CANAL CONSTRAINT

This alternative is a more holistic approach to the system, attempting to include S-356 as well as raising G-3273 constraint and modifying the L-29 Borrow Canal

(BC) constraint. It includes the operations in Alternative C above with some additional regional operational changes: the addition of the S-356 operations, the G-3273 constraint would be raised six inches to 7.3 feet NGVD, and the L-29 BC stage constraint listed in the IOP operations table would be modified to match Florida Department of Transportation (FDOT) current constraint of 7.5 ft NGVD. This alternative represents the Preliminary Draft Proposed Interim Operating Criteria for 8.5 SMA Project, which was presented at the public meeting in January 2008.

2.1.5 ALTERNATIVE E – S-357 OPERATIONS AS DESCRIBED IN THE JULY 2000 FSEIS – NO LIMITATION ON DETENTION CELL OVERFLOW

Under Alternative E, S-357 would be operated as follows:

The pump station...will “trigger” or turn on/off based on water levels measured in a proposed stilling well to be located adjacent to the new seepage canal approximately 4,000-ft. to the west of L-31 N canal.

This alternative does not prohibit overflow events from the detention cell and has no constraint on the pumping capacity limitation. For more information on this alternative please see Section 7.0 “Description of the Recommended Plan” in the July 2000 GRR.

2.2 ISSUES AND BASIS FOR CHOICE

The alternative plans were evaluated based on ability to provide flood mitigation for the 8.5 SMA and potential environmental effects (benefits and impacts). The Recommended Plan ensures that floodwaters discharged from 8.5 SMA meet state water quality standards while also providing flood mitigation to 8.5 SMA in a manner consistent with the authorized purposes of the MWD and C-111 Projects.

The MODBRANCH model was used to estimate the potential impacts of the proposed operations of the 8.5 SMA project features and the regional area. Two scenarios were examined using the model. One scenario was the existing conditions under the IOP operations, referred to in this EA as Alternative A (and described in the modeling **Appendix D** as Alternative 7R). The other scenario is described in the modeling appendix as “8.5 SMA Alternative 6D in place, with S-357 and S-331 operations modified as specified in proposed interim operating criteria.” The modeled scenario represents Alternative C in this EA. For the full MODBRANCH Modeling Summary for 8.5 SMA (S-357) please see **Appendix D**. It is important to note that the modeled alternative is not the recommended plan. Rather, the modeling (Alternative C) was used to predict potential impacts due to S-357 pumping and those results were used to adjust operations for Alternative B in order to minimize negative impacts.

The final alternatives were reviewed using the MODBRANCH results as a baseline of potential impacts. Alternative B was then adjusted to minimize or avoid those impacts. The purpose of the project is to maintain the surface and groundwater levels within the 8.5 SMA at the same levels expected prior to the implementation of any MWD Project components and preserve hydroperiods near the 8.5 SMA. The Preferred Alternative is the plan that best meets this objective while minimizing negative impacts and still providing some ancillary environmental benefits.

2.3 PREFERRED ALTERNATIVE(S)

Based on this impact analysis and public input on the Preliminary Draft Proposed Interim Operating Criteria for 8.5 SMA Project, Alternative B is the preferred alternative. This plan does the best job of maintaining the surface and groundwater levels within the 8.5 SMA at the same levels expected prior to the implementation of any MWD Project components and preserving hydroperiods near the 8.5 SMA. The other final alternatives were eliminated for the following reasons:

- Alternative A – No Action – Does not meet the project purpose of providing flood mitigation to the 8.5 SMA
- Alternative C – This alternative was modeled and negative environmental impacts were observed. Significant changes in hydroperiod were seen in many of the areas surrounding the 8.5 SMA. Hydrologic modeling showed that drying could occur to the North of the perimeter levee. In addition, higher water levels were observed North of S-331 which could be an impact to those areas during wet years. Beyond the modeling observations, S-331 operations could be limited by the trigger being located at Las Palmas gage, which might not allow enough water to be moved through the South Dade Conveyance System to relieve high water levels in WCA 3 during IOP Column 2 operations.

2.4 ALTERNATIVES ELIMINATED FROM DETAILED EVALUATION

Alternatives D and E were eliminated from detailed evaluation. Alternative D was eliminated because this alternative included many features which were not directly related to the purpose of this project. The primary purpose of this project is to provide flood mitigation to the 8.5 SMA due to any potential increase in water levels as a result of components of the MWD 8.5 SMA Project that have already been built. Alternative D attempted to achieve regional changes which would significantly exceed the stated project purpose. The inclusion of S-356 and modifications to the G-3273 constraint and L-29 BC constraint do not address the project purpose. Increased discharges to NESRS may be alternatively pursued under a separate process in the short-term, or following completion of the remaining MWD project components in the longer term. Including other regional project modifications while ensuring efficient and

effective 8.5 SMA flood mitigation would unnecessarily trigger reformulation of IOP components and the associated public process as well as the time-consuming development of a complex EIS. This could result in significant delays unnecessary for the operation of S-357. Some of the key concerns with this plan included:

- Concern that the removal of the G-3273 constraint could increase delivery of flows into NESRS (stages), and operation of the S-356 pump station might be required to mitigate for increased seepage into L-31N.
- Some parties expressed concern that the operation of S-356 could take away canal capacity from S-333, which could cause an impact to WCA-3A and the endangered Snail kite.
- The removal of the G-3273 constraint could result in an alteration of the IOP stage constraint for the L-29 BC. This could impact stages within WCA-3A and the Snail kite.

It is important to be able to operate the S-357 pump station as soon as possible, therefore Alternative D was eliminated. Alternative E was eliminated due to the potential for untreated water to overflow out of the 8.5 SMA detention cell into the C-111 NDA lands which are not yet complete. This could cause a potential water quality issue and is not acceptable. The authorized 8.5 SMA Project Component water plan as described in the July 2000 FSEIS (Alternative E) assumed that the C-111 project would be complete and ready to operate when the S-357 began to operate. Since the C-111 NDA is not yet complete, this is not a viable option. It was included as an alternative since it was a component of the recommended plan of a previous NEPA document; therefore it warranted discussion and an explanation of why it is not viable.

2.5 COMPARISON OF FINAL ALTERNATIVES

The final alternatives evaluated in detail include Alternatives A, B, and C. This comparison details impacts under the no action alternative and two variations of operations for 8.5 SMA project features. All construction needed for this project has been completed and was analyzed in earlier NEPA documents. A detailed comparison of the alternatives by affected resources is found in **Section 4** of this document.

2.6 MITIGATION

Mitigation of environmental impacts is appropriately discussed in terms of avoidance, minimization, and compensatory actions that reduce or offset the negative environmental impacts resulting from an action. These Proposed Interim Operating Criteria for 8.5 SMA Project will not create any environmental impacts that would require mitigation. Other portions of the 8.5 SMA Project have been covered in previous NEPA documents.

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3.0 AFFECTED ENVIRONMENT

3.1 GENERAL ENVIRONMENTAL SETTING

The affected environment of the 8.5 SMA was previously described in the July 2000 GRR/FSEIS. This information provides a description of the existing conditions at that time and still serves as the basis for comparison of alternatives. Updated conditions are provided below.

The 8.5 SMA presently encompasses approximately ten square miles of mixed use development. The 8.5 SMA is located in the East Everglades, approximately 20 miles southwest of Miami, approximately ten miles north of Homestead, and 6.6 miles south of U.S. Highway 41. It is bounded on the east by L-31N, on the west by NESRS (part of ENP), on the north by SW 104th Street, and on the south by SW 168th (Richmond Drive) Street (GRR 2000).

Historically, NESRS and the 8.5 SMA were part of a single hydrologic unit. However, as part of the 8.5 SMA Project, a seven mile perimeter levee was built separating NESRS and the 8.5 SMA. In addition to this levee, the 8.5 SMA Project included construction of a three mile seepage canal within the 8.5 SMA, a detention cell to the south of the 8.5 SMA, and a flowway connecting the seepage canal to the detention cell. A pump station (S-357) was also installed where the seepage canal meets the detention cell flowway. (See *Figure 1-2*) The 8.5 SMA Project also increased wetland area along the NESRS, while increasing upland areas within the 8.5 SMA. Lands west of the protection levee that were once part of the 8.5 SMA have been cleared of all buildings, pump houses, septic tanks, concrete pads and general trash. Wells have been properly abandoned.

The affected environment considered in this EA is geographically defined by those areas which, based on highly permeable soils and geologic materials and control of surface flow by canals and levees, may see significant hydrologic changes as a result of the interim operating plan. The principal areas of concern are: the 8.5 SMA, the detention cell and its flowway, and the NDA. However, because groundwater impacts could potentially extend beyond these areas, the affected environment for this document also includes lands extending outward approximately one mile from the principal areas. The affected area within one mile of the specific sites described above would include lands in the Everglades Expansion Area to the east of NESRS, as well as agricultural lands immediately adjacent to the 8.5 SMA along L31N.

Local rainfall is a significant source of freshwater in the area. After intense precipitation, surface water is removed either through evapotranspiration, seepage to the underlying Biscayne Aquifer, or drainage through the L-31N Canal along the eastern portion of the 8.5 SMA. Excess rainfall, particularly

during the wet season, often inundates most of the 8.5 SMA, which historically contributed to the sheet flow that supplied surface water to the ENP on a regional scale. Canals, such as L-31N, tend to speed surface water drainage and preclude the natural seepage process to the underlying aquifer.

3.2 VEGETATION

The plant communities of the 8.5 SMA were classified and mapped by the Wetland Rapid Assessment Procedure (WRAP) Assessment Team for the 2000 GRR. The classification included one upland cover type, eight wetland types, one open water type, and a catch-all cover type for lands converted to agricultural or residential uses. Based on the WRAP mapping, 42 percent (2699 acres) of the 8.5 SMA is classified as wetlands, one percent (65 acre) as uplands, and 57 percent (3646 acre) as residential and/or agricultural lands. Since construction, Maidencane (*Panicum hemitomon*) has become established in the detention cell.

3.3 THREATENED AND ENDANGERED SPECIES

A variety of species listed as threatened, endangered, or of special concern occur or may potentially occur in the project area. Federally listed species that could occur in the project area or be affected by the proposed action include the Everglade snail kite, wood stork, Cape Sable seaside sparrow (CSSS), Florida panther, West Indian manatee and eastern indigo snake. Species listed by the State of Florida as threatened, endangered, or species of special concern are found in **Table 3-1**. The CSSS is the most critically endangered.

3.3.1 SNAIL KITE (*Rostrhamnus sociabilis plumbeus*)

Snail kites, listed as endangered in 1967, require long hydroperiod wetlands that remain inundated throughout the year. Suitable habitat for the kite includes freshwater marsh, and shallow vegetated lake margins where prey (apple snails) can be found. Critical habitat for the snail kite was designated in 1977 and includes Water Conservation Area (WCA) 1, 2, and 3A, and portions of ENP as well as Lake Okeechobee shorelines and portions of the St. Johns marsh. Preferred nesting habitat includes small trees and shrubs such as willow, bald cypress, pond cypress, sweet bay, dahoon holly, southern bayberry, and elderberry. During dry periods when suitable shrubs and trees experience dry conditions, herbaceous vegetation is utilized for nesting (Sykes et al., 1995). During these dry conditions, herbaceous species such as sawgrass, cattail, bulrush, and common reed are used for nest sites. The snail kite's breeding season can vary from year to year depending on rainfall and water levels. Ninety-eight percent of nesting attempts occur between December through July while 89 percent are initiated between January and June.

3.3.2 WOOD STORK (*Mycteria americana*)

The wood stork was listed as endangered in 1984 due to loss of foraging habitat and colony nesting failures (FWS, 1999b). Preferring freshwater wetlands for nesting, roosting, and foraging, wood storks can be found throughout central and southern Florida. Nests are typically constructed in tree stands within swamps or stands surrounded by large areas of open water. Due to its tactile feeding methods, storks feed most effectively in shallow water settings where prey items are concentrated. During the winter and spring dry seasons when water levels naturally recede, prey items are often further concentrated providing foraging areas with abundant food supplies. Drainage in southern Florida may be responsible for delayed nesting by the stork, moving from an early nesting start in November, to February or March. Initiation of nesting this late is believed to contribute to nest failures and colony abandonment due to the dispersal of prey items associated with the onset of the wet season (May-June).

3.3.3 CAPE SABLE SEASIDE SPARROW (*Ammodramus maritimus mirabilis*)

Cape Sable seaside sparrows (CSSS) are medium sized sparrows restricted to the Florida peninsula. They are non-migratory residents of freshwater to brackish marshes. The CSSS are known to nest in mixed marl prairie communities that often include muhly grass (*Muhlenbergia filipes*). These short-hydroperiod (the period of time during which a wetland is covered by water) prairies contain moderately dense, clumped grasses, with open space permitting ground movements by the sparrows. They commonly feed on soft-bodied insects from low-lying vegetation and avoid sites with permanent water cover.

The CSSS tends to avoid tall, dense, sawgrass-dominated communities, spike rush (*Eleocharis* spp.) marshes, extensive cattail (*Typha* spp.) monocultures, long-hydroperiod wetlands with tall, dense vegetative cover, and sites supporting woody vegetation (Werner 1975, Bass and Kushlan 1982). CSSS also avoid sites with permanent water cover (Curnutt and Pimm 1993). The suitability of short-hydroperiod Everglades, mixed marl prairie communities for the CSSS, is driven by a combination of hydroperiod and periodic fire events (Kushlan and Bass 1983).

CSSS build nests near the ground with an average nest height of approximately 16 cm (6.3 in) above the ground surface (between the soil surface and the base of the nest). The average nest height increases after the onset of the wet season rainfall pattern, which typically begins in early June (Lockwood et al. 2001). This appears to be an adaptive response to rising surface water conditions. Nesting has been observed from late February (Werner 1975) through early August (Dean and Morrison 2001). The majority of nesting occurs in the spring when large areas of the Everglades marl prairies are dry.

In the 1930's, Cape Sable was the only known breeding range for the CSSS (Nicholson 1928). Areas on Cape Sable that were occupied by CSSS in the 1930's have experienced a shift in vegetative communities from freshwater vegetation to mangroves, bare mud flats, and salt-tolerant plants, such as *Batis maritima* and *Borrichia frutescens* (Kushlan and Bass 1983). As a result, Cape Sable seaside sparrows no longer use this area. More recently, continued alterations of CSSS habitat have occurred as a result of changes in the distribution, timing, and quantity of water flows in South Florida. Water flow changes appear to be the leading contributor to the decline in sparrow population, which subsequently threatens the subspecies with extinction. Competition and predation also threatens the CSSS. Raccoons (*Procyon lotor*), snakes, rice rats (*Oryzomys palustris*), and hawks may be the chief predators.

As mentioned, favorable nesting habitat requires short hydroperiod vegetation characteristic of mixed marl prairie communities. A measure of the potential for CSSS nesting success is the number of consecutive days between March 1 and July 15 that water levels are below ground surface. Preferable discontinuous hydroperiod durations range from 60 to 180 days, although a 40 to 80 consecutive day period is considered favorable (Pimm et al. 2003). Vegetative communities averaging longer hydroperiods generally transition into sawgrass dominated freshwater wetlands; not conducive for successful CSSS nesting.

Presently, the known distribution of the CSSS is restricted to two areas of marl prairies east and west of Shark River Slough in the Everglades region (within Everglades National Park and Big Cypress National Preserve) and the edge of Taylor Slough in the Southern Glades Wildlife and Environmental Area in Miami-Dade County. Units 5 and 2 (Subpopulations F and C) are the closest subpopulations to the project area. Unit 5 is immediately west of the C-111 detention ponds and Unit 2 is immediately west of the Frog Pond area.

The 1992 GDM/EIS for the MWD project determined that impacts to fish and wildlife resources, including the sparrow, were within acceptable ranges. Integrated operation of the completed components of the MWD Project and existing components of the C&SF Project are governed by an IOP. The IOP is described in the *2006 Interim Operating Plan for the Protection of the Cape Sable Seaside Sparrow Final Supplemental Environmental Impact Statement*. This IOP was formulated to protect the CSSS, and this proposed interim operating criteria would be incorporated into the IOP.

3.3.4 EASTERN INDIGO SNAKE (*Drymarchon corais couperi*)

It is possible that Eastern indigo snakes occur within the 8.5 SMA. Eastern indigo snakes could find necessary resources in and around the higher elevations in the eastern portion of the area. Susceptible to desiccation, the indigo is often

found utilizing gopher tortoise burrows as a refuge. There are no reported occurrences of the Eastern indigo snake within the 8.5 SMA.

3.3.5 FLORIDA PANTHER (*Felis concolor coryi*)

It is likely that Florida panthers occasionally utilize the 8.5 SMA. A deceased panther was found in the ENP just south of 168th Street in January 2000 (FWS, 2000). Records for a 15-month old male panther and a four-year old female panther indicate that they have been sited near, but not within, the 8.5 SMA. **Table 3-1** below provides the state species of concern in the area.

TABLE 3-1: SPECIES LISTED BY FLORIDA GAME AND FRESHWATER FISH COMMISSION AS THREATENED, ENDANGERED, AND SPECIES OF SPECIAL CONCERN, EXCLUDING FEDERALLY-LISTED SPECIES

American alligator, <i>Alligator mississippiensis</i>	Special Concern
Everglades mink, <i>Mustela vison evergladensis</i>	Threatened
Florida sandhill crane, <i>Grus canadensis pratensis</i>	Threatened
Florida tree snail, <i>Liguus fasciatus</i>	Special Concern
Limpkin, <i>Aramus guarauna</i>	Special Concern
Little blue heron, <i>Egretta caerulea</i>	Special Concern
Mangrove rivulus, <i>Rivulus marmoratus</i>	Special Concern
Miami black headed snake, <i>Tantilla oolitica</i>	Threatened
Roseate spoonbill, <i>Ajaia ajaja</i>	Special Concern
Snowy egret, <i>Egretta thula</i>	Special Concern
Tricolored heron, <i>Egretta tricolor</i>	Special Concern
White ibis, <i>Eudocimus alba</i>	Special Concern

Source: Florida Game and Freshwater Fish Commission 2008

3.4 FISH AND WILDLIFE RESOURCES

The following discussion of fish and wildlife resources was distilled from the Final Coordination Act Report (FWS/NPS 2000) prepared specifically for the 2000 8.5 SMA FSEIS and from biological reconnaissance by Miami-Dade County (DERM, 1999). Conditions within the 8.5 SMA likely provide important resources for opportunistic small animals including raccoons, rabbits, squirrels, songbirds, hawks, kestrels, crows, turkey vultures, frogs, and various reptiles. White-tailed deer were observed in the study area, specifically within ENP, but only limited resources for these large ungulates were apparent within the project area. On-site surveys found the greatest degree of species richness within the forested wetland systems within the ENP lands to the west of the 8.5 SMA, whereas species richness was lowest in wetlands on higher elevations (7.0-8.0 feet NGVD) in the eastern regions of the 8.5 SMA, in close proximity to L-31N.

This eastern region of the 8.5 SMA is dedicated to agricultural and residential land uses, providing only marginal benefits to resident wildlife. High water

conditions within the study area have prompted land owners/managers to alter (i.e., ditching) natural landscape features to provide flood relief and optimize agricultural production. It appears that many years of continuous anthropogenic activity in this area is correlated with invasion of exotic species and roadside (including vacant lots) accumulation of human refuse (i.e. household garbage, derelict appliances, and vehicles). As a result, reductions in wetland function are more dramatic in the eastern portions of the 8.5 SMA as compared to the west and ENP, and opportunistic flora and fauna with strict resource requirements likely do not thrive.

The change in fish and wildlife diversity and wetland function between the western and eastern portions of the 8.5 SMA correlates with an elevation gradient (increasing elevations from west to east) and land use. Both elevation and land use are inter-dependent co-variables as lower elevations correlate with frequent flooding that limits the extent and type of land use. Higher elevations are more compatible with agricultural, commercial, and residential land uses. The following provides a brief overview of wildlife observed within the 8.5 SMA as presented in the FCAR.

3.4.1 AVIFAUNA

Avian diversity in this region of south Florida is high. Waterfowl, wading birds, and other bird species that depend upon wetlands for critical resources dominate avian communities in this area. DERM identified 142 species of birds in the study area (DERM, 1999). There are two significant nesting sites for mixed wading bird colonies, just south of Tamiami Trail and northwest of the 8.5 SMA inside NESRS. Species that nest may include wood stork, white ibis, roseate spoonbill and snowy egret.

3.4.2 MAMMALS

According to DERM (1999), 21 species of mammals have been recorded in the 8.5 SMA. Of these, 11 were observed by DERM staff in 1997 and 1999.

3.4.3 FISH, AMPHIBIANS, AND OTHER AQUATIC ANIMALS

Surveys conducted during December 1999 and January 2000 by the WRAP team recorded five species of small fish, two species of frog, and a variety of aquatic invertebrates.

The construction of the detention cell during the 8.5 SMA Project has provided benefits to ducks, shorebirds and wading birds. Birds have been observed extensively using any areas retaining water.

3.5 HISTORIC PROPERTIES

The 8.5 SMA is located along the eastern periphery of the historic Everglades. There are no known prehistoric or historic period archaeological resources

located within the 8.5 SMA. However, according to the Florida Division of Historical Resources (FDHR), there are two known sites positioned on tree islands in the ENP expansion area immediately to the north and west. Site DA85 is a black dirt midden site occupied during the Glades II Period (A.D. 750-1200). Site DA1085 is also a black midden site but was occupied during portions of the Glades I (500 B.C.-A.D. 750), Glades II, and Glades III (A.D. 1200-1500) periods. Both sites are located on the north ends of tree islands.

A cultural resource assessment survey of the 8.5 SMA Project was performed during Spring 2000. Extant tree islands were subjected to surface inspection and subsurface shovel testing. No cultural resources were encountered.

3.6 SOCIO-ECONOMIC

Socio-economic conditions in the project area have not changed significantly from the description in the July 2000 8.5 SMA GRR/FSEIS. Please see Sections 3.22 and 3.23 of that EIS for more details.

3.7 AESTHETICS

The western portion of the study area overlooks the adjoining ENP parkland. The Everglades have long been renowned for its expansive and picturesque marshes, wet prairies, and tree islands. The 8.5 SMA is visually flat; therefore there are few wide-ranging panoramic vistas to be appreciated, except from the vantage point of man-made structures such as highway overpasses, multi-story buildings, towers, and levees. From street or house-level inside the area the views are limited by trees, fence rows and man-made barriers.

3.8 RECREATION

Several opportunities for passive recreation, such as hiking, birding, wildlife viewing, and nature photography are currently available in the publicly owned lands in western portions of the 8.5 SMA and adjoining portions of the ENP, including the Chekika Hammock facility.

3.9 WATER QUALITY

Although water is the lifeblood of the Everglades system, it is also potentially a medium of pollutant transport. The south Florida region, including the 8.5 SMA, presents a unique situation with the coexistence of extensive agricultural and urban areas in close proximity to ecologically sensitive wetlands and marine resources. All are dependent upon the regional water supply. A significant component of the present delivery of waters to ENP originates from or passes through agricultural areas having the potential to alter or degrade water quality (Sheidt, 1989). The other major component of the water delivered the ENP is from rainfall onto the upstream WCA's. The Everglades evolved in a relatively nutrient-poor environment and as a result, the release of nutrients has changed the sawgrass and wet prairie habitat. Cattail monocultures have been found to

develop around disturbances such as drainage, canal construction and other human activity. These monocultures have specifically been found in the 8.5 SMA.

The quality of water in the Biscayne aquifer typically complies with State Drinking Water Standards and is typically suitable for all urban demands with limited treatment. Poor water quality exists in some coastal areas that are impacted by chemical contamination or saltwater intrusion. Areas that are affected by saltwater intrusion tend to be localized in linear extent due to the constant recharge (high water levels) maintained at the various water control structures. Because the Biscayne Aquifer is close to the surface and highly permeable, groundwater is vulnerable to contamination. The Biscayne Aquifer is the drinking water source for Miami Dade and has the designation as a sole source drinking water aquifer. Rapid urbanization combined with growth of agriculture continues to threaten shallow groundwater from a variety of manmade sources. The ground water quality in the 8.5 SMA has been affected to some degree by the lack of municipal sewer service for this area but is still generally considered to be of good quality unless directly adjacent to residential tracts. The area has a four to six foot cap rock that is fairly impermeable but does have some direct conduits to the underlying Biscayne Aquifer. Typically the 8.5 SMA residents have septic systems and in the past not all these systems have been to code. Bringing the entire 8.5 SMA up to code with sanitary waste treatment systems is part of an ongoing process that is incrementally improving that situation. This area is presently authorized for low density housing (one residence per 40 acres unless grandfathered in). There is some agricultural use as well as some small business activities that are agricultural in nature. It may also be zoned for some light industrial use. The Adopted 2015-2025 Comprehensive Development Master Plan identifies this area as “open land” which implies that zoning will be further restricted in the future. That zoning restriction reduces the risk to the Biscayne Aquifer. Some of the major well fields for Miami Dade are to the south and southeast of the 8.5 SMA and they are not required to perform any significant treatment for the water produced from those well fields.

Conclusions regarding the water quality of the 8.5 SMA can be made based on the data and literature review of studies within the vicinity of the 8.5 SMA. Constituents of concern appear to be pesticides, nutrients, and bacteria. Toxic organics and metals do not appear to be a concern, although unidentified problems could exist.

Although surface water at the L-31N shows detections of pesticide residues to be typically at low levels, as mentioned in the Public Employees for Environmental Responsibility report, there appears to have been no studies of pesticides in the 8.5 SMA that focused on water quality in agricultural drainage canals or L-31N during pesticide application periods. The possibility exists that elevated levels

of pesticides occur for transient periods following pesticides applications but this has not been documented. This would also apply to agricultural areas outside of the 8.5 SMA.

The SFWMD has an extensive and comprehensive pesticides monitoring program in south Florida. Any unusual hits or detections are traced to the upstream source and appropriate measures are taken as necessary. Nutrient levels appear to be elevated in some agricultural and residential areas. The PEER study hypothesized that phosphorus is retained by soils in the 8.5 SMA and does not move outside the project area, although this could not be proved. This conclusion assumes that all groundwater flow from the 8.5 SMA is intercepted by the L-31N Canal. Related studies of total phosphorus associated with septic systems in Miami-Dade County showed elevated levels in groundwater (PEER, 1998).

Data concerning indicator bacteria were limited, but show some evidence that humans may have impacted water quality due to septic systems in the 8.5 SMA. In the Richmond Drive residential area, the fecal coliform/fecal streptococcus ratio (>8) in surface water samples indicated the likelihood that the source of the bacteria is from human sources.

The general conclusion is that the 8.5 SMA, due to the low density residential zoning (one residence per 40 acres unless grandfathered in) and the past and present use, is not expected to present a significant ground water or surface water quality problem to the surrounding areas.

3.10 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

A reconnaissance of the 8.5 SMA was undertaken by DERM in 1999 to identify land use activities within the 8.5 SMA on a parcel by parcel basis (unpublished data). The DERM site reconnaissance indicates numerous parcels where unregulated activity is taking place. The activities of concern included several properties with abandoned automobiles, abandoned boats, unidentified waste piles, pump stations, outhouses, garage and storage sheds, and numerous animal pens. These land use activities could potentially impact soil, groundwater, or surface water quality in the 8.5 SMA.

A hazardous, toxic and radioactive waster (HTRW) site was discovered on a property acquired by the USACE for this project. In the process of clearing this site an undocumented and unauthorized lead recovery operation from lead/acid batteries was discovered in 2005. It was determined to be a HTRW site as result of testing and further investigation in 2006. Wastes piles of the lead/battery casing materials were found buried on this location, which was contained within a five-acre area, as well as being scattered about this site on the surface soils. An extensive monitoring and cleanup program was implemented and this site

has been fully cleared by the FDEP waste cleanup section, the EPA delegated authority for HTRW cleanups of this nature. No impacts to the ground water system were identified from this HTRW site based on the results obtained from the site location monitoring wells and adjacent private property drinking water wells.

Based on the review of available federal and state lists, it does not appear that the 8.5 SMA has been directly impacted by hazardous or petroleum wastes or products. The presence of underground fuel tanks within the 8.5 SMA constitutes a potential source for petroleum contamination of the Biscayne Aquifer due to its close proximity to ground surface, and the shallow water table. Unregulated activities outlined above are generally confined to small, localized areas, and are not considered a significant issue of concern.

An evaluation of the detention cell created during the 8.5 SMA Project showed that some of the soils exceeded residential levels for copper but the highest levels found were about 0.3 percent of the soil clean-up target level for industrial sites. The soil sample from the detention cell with the highest copper level was tested for the potential of leaching (SPLP test) into the ground water. This testing revealing that the water passing through this soil sample did not exceed the drinking water standard for copper. These soils did however present a potential concern from the ecosystem risk potential of bioaccumulation from benthic organisms within this impoundment. As a result of this concern, the majority of the soils within this detention area were removed from the detention cell to address this ecosystem risk concern. Final clearance of this site for unrestricted operations (impoundment of water within the detention cell for extended time periods) is being coordinated with the FWS and the FDEP. USACE has preliminary approval from the FWS ecosystem risk group to operate the detention cell as long as apple snail monitoring is conducted. USACE has agreed to the snail monitoring requirement. The details of the monitoring are being finalized. The purpose for the apple snail monitoring is to confirm no harmful level of bioaccumulation is occurring in this food source for the snail kite

3.11 AIR QUALITY

Primary sources of air pollution originate from transportation, stationary source fuel combustion, industrial processes, and solid waste disposal. Since there are only two paved roads in the 8.5 SMA and no industry, significant sources of air pollutants from this area present little if any concern to the regional air quality. With the implementation of the new ozone standard by EPA, Miami-Dade County is presently in compliance for this new standard based on a review of the FDEP Air Quality website on September 10, 2008. In 2006 EPA designated the State of Florida as being in attainment for all criteria pollutants (2006 Florida Air Monitoring Report, Executive Summary

(<http://www.dep.state.fl.us/Air/publications/techrpt/amr06.pdf>). All required air quality related permits were obtained for the operations of S-357 from DERM and FDEP.

3.12 NOISE

Noise levels are associated with surrounding land use. There are no significant noise-generating land users within the project area.

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4.0 ENVIRONMENTAL EFFECTS

This section is the scientific and analytic basis for the comparisons of the alternatives. See **Table 4-1** below for a summary of impacts. The following discussion includes anticipated impacts under Alternative A (existing conditions) and Alternative B (the Recommended Plan). The potential hydrologic impacts were estimated using the MODBRANCH model with limitations as discussed in **Section 2.2**. This section only covers impacts that were not covered in previous NEPA documents. The cumulative impacts section will discuss the larger picture of past, present and future potential impacts.

TABLE 4-1: POTENTIAL ENVIRONMENTAL EFFECTS OF FINAL ALTERNATIVES

Resource	Alternative A – No Action	Alternative B - S-357 operations and S-331 Operational Flexibility with limited pumping capacity	Alternative C – S-357 operations and S-331 trigger gage change with no limit on pumping capacity
Hydrologic	S-331 would continue to be the main source of flood protection for the area. No mitigation for increased flooding potential would occur.	Potential to benefit ENP due to increased hydroperiods. Operational flexibility for S-331 would provide some environmental benefits to NESRS due to less overall pumping needed to control groundwater levels. Existing levels of flood control would be maintained.	At full pumping capacity, potential to increase hydroperiods to the east and west. Potential benefits to ENP due to increased hydroperiods. Alternative C would provide more environmental benefit to ENP (compared to Alternative B) due to S-331 trigger gage internal to 8.5 SMA levee. Potential to limit ability to use S-331, making it more difficult to move water through the SDCS and out of WCA-3. Potential for higher water levels in wet years in the 8.5 SMA next to L-31 North and above S-331, resulting occasionally in higher water stages than currently occur This would be a negative impact to that area and could result in a reduction of level of service during extreme precipitation events in wet year.

Vegetation	No effect	No significant impacts. Potential for aquatic vegetation to temporarily establish in detention cell during wet years when water is ponded for long periods.	No significant impacts. Potential for aquatic vegetation to temporarily establish in detention cell during wet years when water is ponded for long periods.
Wetlands	No effect	Pumping limitation set at 500 acre-feet per day should help to minimize impacts to regional wetlands. Monitoring gages would be reviewed to identify any negative impacts.	Potential for changes to hydroperiods based on full capacity pumping. Could negatively impact areas to the North of the perimeter levee. Monitoring gages would be reviewed to identify any negative impacts.
Fish and Wildlife	No effect	No significant impacts to fish and wildlife. Potential for migratory birds to use detention cell when inundated.	No significant impacts to fish and wildlife. Potential for migratory birds to use detention cell when inundated.
Listed Species	No effect	All species were determined as “may affect not likely to adversely affect.” CSSS habitat could incur some change in hydroperiods. Also snail kites could be impacted if soil copper levels were found to bioaccumulate in apple snails, should apple snails become established in the detention area. Because detention area is likely to stay dry often, this may not be likely to occur.	CSSS habitat could incur some significant change in hydroperiods. Also snail kites could be impacted if soil copper levels were found to bioaccumulate in apple snails, should apple snails become established in the detention area. Because detention area is likely to stay dry often, this may not be likely to occur.
Water Quality	No effect	Slightly elevated copper levels in detention cell as mentioned above. This issue is being	Slightly elevated copper levels in detention cell as mentioned above. This issue is being coordinated with relevant agencies. Some water quality

		coordinated with relevant agencies. Some water quality treatment could result from seepage through the detention cell.	treatment could result from seepage through the detention cell.
Historic Properties	No effect	Coordinated in earlier NEPA reports. No effect.	Coordinated in earlier NEPA reports. No effect.
Socioeconomic	Potential for flooding impacts to be exacerbated due to existence of already constructed ModWaters features with no flood mitigation pump operating.	Beneficial impacts due to flood mitigation provided by pumping.	Beneficial impacts due to flood mitigation provided by pumping.
HTRW	No effect	Nothing was found (abandoned HTRW sites) that would cause Comprehensive Environmental Response Compensation and Liability Act (CERCLA) to be implemented. A limited area on the site was found to have a chlordane spill which was fully remediated before any construction began on this location.	Nothing was found (abandoned HTRW sites) that would cause Comprehensive Environmental Response Compensation and Liability Act (CERCLA) to be implemented. A limited area on the site was found to have a chlordane spill which was fully remediated before any construction began on this location.
Air Quality	No effect	The USACE has applied to and received all required permits (associated with the diesel powered pump station) from the EPA delegated authorities (DERM and FDEP) with Clean Air Act	The USACE has applied to and received all required permits (associated with the diesel powered pump station) from the EPA delegated authorities (DERM and FDEP) with Clean Air Act responsibilities.

		responsibilities.	
Noise	No effect	Localized noise would increase due to the pump operations.	Localized noise would increase due to the pump operations.

4.1 GENERAL ENVIRONMENTAL EFFECTS

The objective of the proposed interim operating criteria is to maintain the surface and groundwater levels between L-357W and L-31N (within the 8.5 SMA) at the same levels expected prior to the implementation of any MWD Project components, while preserving hydroperiods near the 8.5 SMA.

4.2 GROUNDWATER AND SURFACE WATER HYDROLOGY

4.2.1 ALTERNATIVE A - NO ACTION

The no-action alternative, or current IOP operations, does not have any proposed operations for the S-357 Pump Station. Therefore no additional flood mitigation would occur. S-331 would continue to be the main source of flood protection for the area. In addition, any benefits to NESRS (as a result of operations of S-357) would not occur. Potential negative impacts under the no action plan include less flexibility in operations of the S-331. By not running the S-357 and having less flexibility in operations of the S-331, there is a continued potential for high precipitation events to lead to ponding of water in the 8.5 SMA due to already constructed Mod Waters project features.

4.2.2 ALTERNATIVE B – S-357 OPERATIONS WITH PUMPING CAPACITY LIMITATION AND S-331 OPERATIONAL FLEXIBILITY

Alternative B would allow more operational flexibility for moving water in the system, resulting in less water moving south through the canal system to South Dade and potentially Florida Bay. The ability to use both Angel's Well and the Las Palmas gage in determining operations is expected to reduce the combined volume of water pumped through S-331 and S-357 (by enabling more localized control of the 8.5 SMA flood mitigation levels) and reduce groundwater losses from ENP to the 8.5 SMA and L-31N canal.

The Angels Well and Las Palmas gages are being utilized in Alternative B for the S-331 Pump Station to provide a measure of the difference in water elevations between C-357 and Everglades National Park. During this interim operational plan, it may become necessary to use the pump stations to move additional water to the south. The modeling (discussed in further detail in Alternative C below) shows triggering off of the Las Palmas gage alone and unconstrained pumping at S-357 could dry out the area on the North side of the perimeter levee. Continued utilization of the water elevations at Angels Well and new utilization of the Las Palmas gage, in addition to a limitation on pumping capacity at S-357, would help avoid hydroperiod reductions within

Everglades National Park. Utilizing Angels Well or the Las Palmas gage would also allow additional flexibility to move water to the hydraulic ridge in the 8.5 SMA detention cell under IOP Column 2 operations. This would allow more flexibility to greater utilize the operations presented in IOP.

Alternative B would not allow for overflow of the 8.5 SMA detention cell into the NDA which is not yet constructed. The water would be retained in the detention cell until it seeps out. The seepage rate would be highly dependent on the existing groundwater levels (if groundwater is already high it would seep more slowly). If groundwater levels are low it would seep quickly. Water will seep towards lower groundwater levels, although some will move west to ENP and some will move east, towards the L-31 Canal.

In order to avoid impacts discussed under Alternative C below, two main adjustments were made to the proposed interim operating criteria. One adjustment made due to potential impacts predicted by the hydrologic modeling was a limit on the pumping capacity at S-357. In order to avoid over-draining ENP and surrounding wetlands, Alternative B only allows a total of 500 acre feet per day to be pumped through S-357. The full capacity of the pump station is expected to be needed when the MWD project is completed and new system operations are approved. In order to operate this pump as quickly as possible, and due to the allowance of adaptive management to adjust operations as needed if impacts do occur due to pump operations, no additional modeling was completed which exactly replicates Alternative B.

4.2.3 ALTERNATIVE C – S-357 OPERATIONS WITH NO PUMPING CAPACITY LIMITATION AND S-331 TRIGGER GAGE CHANGED TO LAS PALMAS

Alternative C is the alternative that was modeled, in addition to the No Action alternative (Alternative A). It has the same trigger operations as Alternative B, but has no pumping capacity limitation. It also uses the Las Palmas gage for the trigger gage as opposed to using Angel's Well and the Las Palmas gage as described for Alternative B.

The MODBRANCH model output did show some regional impacts. For more details on the modeling results including figures, see **Appendix D**.

The model was used to review hydroperiod differences between the existing conditions (Alternative A) and the pump station operations for an average, dry and wet year. For the average year, the hydroperiod is generally the same throughout the model domain. There was a slight decrease in the Taylor's Slough headwaters. This could be a result of C-357 intercepting water that would normally leak into L-31N, flow south, and be available for pumping into either the C-111 detention ponds or into the Frog Pond area by S-332D.

The dry year showed very small changes in the hydroperiods, especially in the immediate project area. The most significant change is the decrease in hydroperiod in the northern part of the C-111 detention ponds. This observed effect is due to the S-357 operations intercepting water that would normally leak into the L-31N Canal. The small decrease in flow is sufficient to reduce water volume into the detention ponds by decreasing the stage in L-31N, which is the trigger for the pumps.

The most dramatic differences are found in the wet year. In this year the S-357 operations as modeled both increased and decreased hydroperiods by more than 50 days in various areas. In the areas west and northwest of the C-111 detention ponds, the hydroperiods increase more than 50 days. This is probably a result of the S-357 pump pushing water south into the S-357 detention cell, causing a localized increase in stage and forming a small hydrologic ridge. Water flowing from NESRS is pushed further south, where it then encounters the hydrologic ridge created by the C-111 detention ponds. This compounds the effect and creates larger hydroperiods. In addition, the higher water levels help to maintain higher headwater stages (in L-31N) for S-332B and S-332C. The higher stages in the ponds induce more return to the canals. This, in turn, produces higher headwaters stages which cause S-332B and S-332C to pump more water. In addition, the modeling of the wet year predicted that in the 8.5 SMA next to L-31 North and above S-331, there is a potential for higher water levels than occur under existing conditions. This would be a negative impact to that area.

4.3 DETENTION CELL HYDROLOGY

This discussion is relevant to both Alternatives B and C in that similar performance would be expected under the two alternatives, although only Alternative C was modeled. Detention cell hydrology was also reviewed using the MODBRANCH model for a dry, average, and wet year (again with no limitation on pumping capacity). The most significant change is for the wet year, 1995. During this year, trigger stage causes the S-357 structure to operate 362 days out of 365. During the average year (1978), S-357 operates only six days. S-357 rarely operates during the dry year (1989). Please see the Modeling *Appendix D* for more details and figures.

The water is above ground during the 1995 simulated year between 146 and 183 days. It appears that the time period with water levels above ground could easily exceed 183 days; the model simulation ends with the average stage still well above ground elevations. The average (1978) and dry (1989) years show no inundation at all. During the average year the stage is between approximately – one and a half to two feet below ground, which indicates that most years with above average rainfall will still be dry within the detention cell.

4.4 FLOOD MITIGATION

4.4.1 ALTERNATIVE A - NO ACTION

No flood mitigation would be provided under the no action plan. S-331 would continue to be the flood control pump for the 8.5 SMA.

4.4.2 ALTERNATIVE B – S-357 OPERATIONS WITH PUMPING CAPACITY LIMITATION AND S-331 OPERATIONAL FLEXIBILITY

S-357 would serve as the flood mitigation structure for the 8.5 SMA. S-357 would work in conjunction with S-331 to ensure that the existing level of service is not altered. MODBRANCH model results on Alternative C below show that the average existing level of service is not reduced within the 8.5 SMA. However it does show some periods during wet years when areas within the 8.5 SMA next to L-31 North and above S-331, have higher water levels compared to existing conditions. Since Alternative B limits pumping capacity and includes operational flexibility to utilize both Angel's Well and the Las Palmas gage for S-331 operations, these high water levels should not occur under Alternative B. The existing level of service would not be reduced within the 8.5 SMA.

4.4.3 ALTERNATIVE C – S-357 OPERATIONS WITH NO PUMPING CAPACITY LIMITATION AND S-331 TRIGGER GAGE CHANGED TO LAS PALMAS

S-357 would serve as the flood mitigation structure for the 8.5 SMA. S-357 would work in conjunction with S-331 to ensure that the existing level of service is not altered. MODBRANCH model results for this alternative do indicate that the 8.5 SMA interim operations do not reduce the average existing level of service within the 8.5 SMA. However it does show some periods during wet years when areas within the 8.5 SMA next to L-31 North and above S-331, have higher water levels compared to existing conditions. This would be a negative impact to that area and could result in a reduction of level of service following extreme precipitation events in wet years.

4.5 VEGETATION

4.5.1 ALTERNATIVE A - NO ACTION

No significant impacts to vegetation are expected under the no-action plan.

4.5.2 ALTERNATIVE B – S-357 OPERATIONS WITH PUMPING CAPACITY LIMITATION AND S-331 OPERATIONAL FLEXIBILITY

No significant impacts to vegetation are expected. The only impacts to vegetation would be related to the quantity and duration of water in the detention cell. The duration of standing water in the 8.5 SMA detention cell would affect the type of vegetative community which establishes at that site. The water will seep into lower groundwater levels, but the seepage rate will depend upon the groundwater levels at the time that the detention cell is full. If

groundwater levels are already very high, the detention cell will stay inundated longer and therefore aquatic vegetation will be more likely to establish. As discussed in **Section 4.2.2.3** above, for an average or dry year the detention cell is expected to be dry. During a wet year, the detention cell might grow some aquatic vegetation, but this would be only temporary in nature

4.5.3 ALTERNATIVE C – S-357 OPERATIONS WITH NO PUMPING CAPACITY LIMITATION AND S-331 TRIGGER GAGE CHANGED TO LAS PALMAS

No significant impacts to vegetation are expected. Impacts would be similar to those discussed under Alternative B above.

4.6 WETLANDS

4.6.1 ALTERNATIVE A - NO ACTION

The no-action plan would not result in significant changes to the current wetland conditions in the area.

4.6.2 ALTERNATIVE B – S-357 OPERATIONS WITH PUMPING CAPACITY LIMITATION AND S-331 OPERATIONAL FLEXIBILITY

No significant impacts to wetlands are expected. The pumping capacity in this alternative is limited to 500 acre-feet per day to avoid over-drainage of nearby wetlands. The gages in nearby areas will be monitored to ensure no significant negative impacts to hydroperiods occur. The following gages will be used to monitor area water levels.

TABLE 4-2: MONITORING GAGES FOR PROPOSED INTERIM OPERATING CRITERIA 8.5 SMA PROJECT FEATURES

Gage	Operating Agency	Measurement
G-596	USGS	Groundwater
G-3272	USGS	Groundwater
G-3273	SFWMD	Groundwater
Angel's Well	SFWMD	Groundwater
Las Palmas	SFWMD	Surface water
S-357	SFWMD	HW, TW, RPM
S-331	SFWMD	HW, TW, RPM
G-211	SFWMD	HW, TW, Gate Opening

Key: HW head water
 RPM revolutions per minute
 TW tail water
 USGS U.S. Geological Survey

If negative impacts occur, the operations will be adjusted through adaptive management to minimize or reduce those impacts. The flexibility in operations of S-331 could allow less seepage of groundwater from ENP into the 8.5 SMA (less overall water being pumped) thereby serving as a benefit to NESRS. If the gages show that wetlands are being negatively impacted, the operations will be adjusted through adaptive management. Wetlands in ENP could benefit from increased hydroperiod due to the increased hydrologic ridge formed due to the 8.5 SMA detention cell. This should reduce seepage losses from ENP south of Richmond drive for at least a few miles and also return a percentage of seepage water back to ENP.

4.6.3 ALTERNATIVE C – S-357 OPERATIONS WITH NO PUMPING CAPACITY LIMITATION AND S-331 TRIGGER GAGE CHANGED TO LAS PALMAS

MODBRANCH modeling did show some potential effects to hydroperiods in nearby wetlands. ENP could see benefits due to the increased hydrologic ridge formed near the 8.5 SMA detention cell. This should reduce seepage losses from ENP south of Richmond drive for at least a few miles and also return a percentage of seepage water back to ENP. The modeling shows triggering off of the Las Palmas gage alone could dry out the area on the North side of the perimeter levee. As described under Alternative B, monitoring gages would be used to determine if impacts are occurring and adaptive management would be used to adjust operations as necessary.

4.7 FISH AND WILDLIFE

The impacts for both action alternatives would be similar and do not vary greatly from those impacts described in the 2000 FSEIS. No significant negative impacts are expected. Under both alternatives the detention cell may be a beneficial spot for birds that like pond habitat. The Florida Fish and Wildlife

Commission (FWC) noted in its comments on the Proposed Interim Operating Criteria for 8.5 SMA Project (Jan 2008 version) that the detention cell is likely to be of particular value for shorebirds, particularly during migration periods when the detention cell holds standing water (although the modeling predicted that there would not be standing water in the detention cell during an average or dry year).

4.8 LISTED SPECIES

Because of the magnitude of USACE efforts underway to implement the various components of the MWD Project, as well as its ongoing responsibilities with the existing C&SF Project, USACE is in continuous coordination with the FWS. Previous related coordination undertaken for the 8.5 SMA component of the MWD Project is included in the 2000 FSEIS. A letter was sent to FWS dated September 3, 2008, requesting coordination for this EA. The FWS replied by letter dated September 19, 2008 with a list of threatened and endangered species located within and adjacent to the project area. Those species are listed below. There is no critical habitat for these species within the proposed project area. The impacts and determinations have not changed from the 8.5 SMA 2000 FSEIS. However, the West Indian Manatee is included in this EA and was not included in the 8.5 SMA 2000 FSEIS.

4.8.1 SNAIL KITE (*ROSTRHAMNUS SOCIABILIS PLUMBEUS*)

The snail kite is a highly mobile species that forages over a very large area in the southern Everglades, perhaps including the wetlands of the project area during certain times of the year. There are no known roosting or nesting sites within the project area. There is no designated critical habitat for kite within the project impact area. There is an unknown potential for apple snails to become established in the 8.5 SMA detention cell during longer inundations. However, as the modeling showed it is unlikely that longer inundations will happen frequently. However, if this did occur the snail kite would likely use this detention cell as a foraging area.

As described in **Section 4.10** above, an evaluation of the detention cell created during the 8.5 SMA Project showed that some of the soils exceeded residential levels for copper. The highest levels found were about 0.3 percent of the soil clean up target level for industrial sites. The soil sample from the detention cell with the highest copper level was tested for the potential of leaching (SPLP test) into the ground water. This testing revealing that the water passing through this soil sample did not exceed the drinking water standard for copper. However, these soils did present a potential concern from the ecosystem risk potential of bioaccumulation from benthic organisms within this impoundment. As a result of this concern, the majority of the soils within the detention cell were removed to address this ecosystem risk concern. Final clearance of this site for unrestricted operations (impoundment of water within the detention for

extended time periods) is being coordinated with the FWS and the FDEP. Due to the past cleanup and ongoing coordination to ensure that the site will not pose a risk to the snail kite, it has been determined that the project may affect but is not likely to adversely affect the snail kite.

4.8.2 WOOD STORK (*MYCTERIA AMERICANA*)

The wood stork is a highly mobile species that forages over a very large area in the southern Everglades, perhaps including the wetlands of the project area during certain times of the year. There are no known roosting or nesting sites within the project area. The nearest such site is along the Tamiami Trail (Tamiami West colony) about five miles to the north. There is no particular important resource for the species in the project area. It is therefore determined that the project may affect but is not likely to adversely affect the wood stork.

4.8.3 CAPE SABLE SEASIDE SPARROW (*AMMODRAMUS MARITIMUS MIRABILIS*)

As discussed above, MODBRANCH hydrologic modeling was performed on Alternative C and Alternative A. This modeling does predict that two CSSS critical habitat units may experience changes in hydroperiod in a wet year. Figure 4.1 below shows the locations of the CSSS habitat units, as they are presently defined by the FWS. Unit 5 which is home to subpopulation F is immediately west of the C-111 detention ponds. Unit 2 is immediately west of the Frog Pond area. Please see modeling appendix D for a more detailed discussion of predicted changes to these critical habitat areas.

Although some changes in hydroperiod were predicted under Alternative C, the Recommended Plan (Alternative B) would have less changes to hydroperiod. Alternative B is identical to IOP operations for S-331, except for the addition of the flexibility to review both Angel's Well and/or Las Palmas when managing operations. Operations per IOP would not alter the hydrology significantly in these critical habitat units. There would be some changes to hydrology, especially during a wet year when S-357 is pumping and the detention cell is inundated. These changes are expected to be minimal and would be monitored to determine if modifications to operations are necessary. These proposed interim operating criteria would be incorporated into, and do not significantly alter, IOP.

It is determined that this project may affect but is not likely to adversely affect the CSSS.

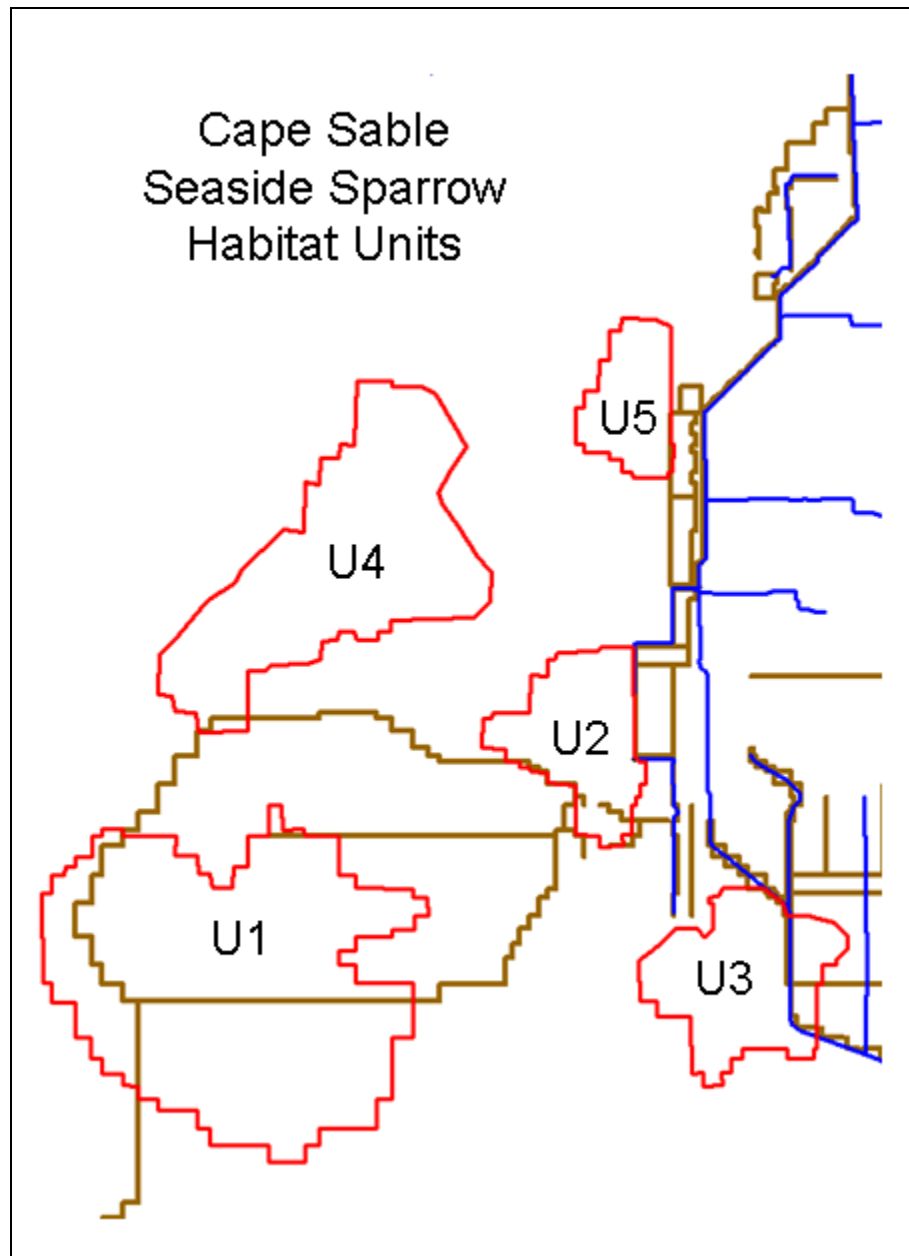


FIGURE 4-1: CAPE SABLE SEASIDE SPARROW HABITAT UNITS

4.8.4 EASTERN INDIGO SNAKE (*DRYMARCHON CORAIS COUPERI*)

The Eastern indigo snake could occur in the upland portions of the 8.5 SMA. Since the detention cell has been scraped of surface soils due to potential contaminant issues, it is unlikely that the indigo snake would utilize this habitat. It is determined that the project may affect but is not likely to adversely affect the Eastern indigo snake.

4.8.5 FLORIDA PANTHER (*FELIS CONCOLOR CORYI*)

These proposed interim operating criteria would not have any impacts of significance to the Florida Panther. All potential impacts due to prior actions were coordinated in past NEPA documents. Panthers have been sited near and infrequently within the 8.5 SMA. Records show that the panther makes very limited use of the lands immediately west of the project area. It is determined that the project may affect but is not likely to adversely affect the Florida panther.

4.9 WATER QUALITY

4.9.1 ALTERNATIVE A - NO ACTION

Under the no-action plan, no water quality impacts would occur. Compared to Alternative B, most water would likely leave the 8.5 SMA through L-31 rather than being pumped through S-357 into the detention cell. Therefore, little to no treatment of the water leaving the 8.5 SMA would occur.

4.9.2 ALTERNATIVE B – S-357 OPERATIONS WITH PUMPING CAPACITY LIMITATION AND S-331 OPERATIONAL FLEXIBILITY

Because no direct discharge of surface water onto ENP is allowed under Alternative B, this plan should not have a negative water quality impact on lands to the south or west. The 8.5 SMA detention cell consists of a wide flowway (about ten acres) for the first cell (maximum depth should be about two and a half feet due to the weir height). Once the first cell is filled, the water overflows a weir into the main cell (about 190 acres) with a maximum depth of about three and a half feet (lowest weir setting). Both cells allow increased oxygenation and ultra-violet (UV) penetration of the water flowing through this system as compared to the intake canal (depth of 15-18feet) water. Settling of particulates is expected to occur to some level within these cells and the increased oxygen levels and UV penetration (as compared to the 15feet deep intake canal) is expected to help reduce any potential concerns from the water collected from this low density urban area. Once the C-111 NDA is complete, the 8.5 SMA detention cell can be overflowed with no significant potential for direct surface water from this pump station entering the ENP. The NDA will provide a large shallow detention area. If the water is retained on the surface, nutrient uptake will occur due to particulate settling (a significant fraction of nutrients are not dissolved when coming out of an urban/agriculture area) and there will be a significant detention time due to the size of the detention area relative to the pumping capacity. A large shallow area with significant detention time is expected to provide biological uptake of phosphorus. USACE field studies indicate that wetting/drying cycles on limestone soils (of which the area is composed) favors the periphyton species that fix phosphorus into a periphyton mat and is not easily remobilized.

4.9.3 ALTERNATIVE C – S-357 OPERATIONS WITH NO PUMPING CAPACITY LIMITATION AND S-331 TRIGGER GAGE CHANGED TO LAS PALMAS

Discussion for Alternative B is also applicable to Alternative C. Water quality issues on this project are in relation to the detention cell, which would function similarly under both alternatives.

4.10 ESSENTIAL FISH HABITAT ASSESSMENT

There is no essential fish habitat (EFH) in the project area and therefore this project should not significantly impact EFH. There may be a slight beneficial impact due to a reduction in water leaving the 8.5 SMA through the S-331 Pump Station and eventually being released into Florida Bay. Under these alternatives, less total water would be pumped due to the flexibility in gage location triggers for the S-331, and some of the water that had been leaving through S-331 would be pumped by the S-357 into the 8.5 SMA detention cell.

4.11 HISTORIC PROPERTIES

All of the project features have already been constructed and have already been analyzed for cultural resource issues. These consultations were documented in previous NEPA documents, primarily the 2000 8.5 SMA GRE/FSEIS. No additional impacts to historic properties are expected due to these proposed interim operating criteria.

4.12 SOCIO-ECONOMIC

4.12.1 ALTERNATIVE A - NO ACTION

The no-action alternative does not allow for operation of the S-357 Pump. Since this pump was built for flood mitigation for the residents of the 8.5 SMA, continuing to not operate this pump would be an adverse impact to the residents. Since some of the features of MWD have already been built, including the 8.5 SMA levees, S-355A, S-355B, S-356, S-334, S-333 and removal of 4 miles of L-67 extension, it is possible that these features could negatively impact the residents of the 8.5 SMA if the pump is not used to mitigate for increased flood risk.

4.12.2 ALTERNATIVE B

Alternative B would provide benefits to the local population by providing flood mitigation. The Proposed Interim Operating Criteria for 8.5 SMA Project is proposed to utilize already constructed features which were built to mitigate increased flood potential for residents of the 8.5 SMA as a result of higher water levels in ENP which will occur when MWD is complete and future system operations are approved. Although MWD flows are not yet occurring, the already constructed features have the potential to modify hydrology in the 8.5 SMA. These interim operating criteria are proposed to address this issue. No adverse socioeconomic impacts are expected.

4.12.3 ALTERNATIVE C

Alternative C would provide benefits to the local population by providing flood mitigation. The Proposed Interim Operating Criteria for 8.5 SMA Project is proposed to utilize already constructed features which were built to mitigate increased flood potential for residents of the 8.5 SMA as a result of higher water levels in ENP which will occur when MWD is complete and future system operations are approved. Although MWD flows are not yet occurring, the already constructed features have the potential to modify hydrology in the 8.5 SMA. These interim operating criteria are proposed to address this issue. However, as mentioned in Sections 4.2 and 4.4, the modeling does indicate that there could be periods during wet years when the water levels could be higher than under existing conditions in some portions of the 8.5 SMA. Under those circumstances the existing level of service would not be maintained.

4.13 AESTHETICS

Under both alternatives there will be no direct or indirect aesthetic impact changes from those previously described in the July 2000 FSEIS.

4.14 RECREATION

Under both alternatives there could be an increased amount of standing water in the detention cell during certain years or parts of the year. This would be conducive to wildlife viewing, hunting and fishing opportunities. The SFWMD will eventually gain control of this facility and determine the appropriate recreational opportunities available to the public. No adverse recreational impacts would occur as a result of this Proposed Interim Operation Criteria for 8.5 SMA Project.

4.15 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

The pump station site has been evaluated for HTRW. Nothing was found (abandoned HTRW sites) that would cause CERCLA to be implemented. A limited area on the site was found to have a chlordane spill which was fully remediated before any construction began on this location.

4.16 AIR QUALITY

No significant air quality impacts are expected under either alternative. Although the S-357 would emit air pollutants, this would be mitigated by less pollutants being emitted from the S-331 Pump Station. Less pumping overall is expected to be required to maintain the same levels of flood protection currently provided by the S-331 to the 8.5 SMA. The USACE has applied to and received all required permits (associated with the diesel powered pump station) from the EPA delegated authorities (DERM and FDEP) with Clean Air Act responsibilities.

4.17 NOISE

The operation of the S-357 Pump Station would result in some additional noise in the area immediately adjacent to the pump station. This is not a change in impact from the 2000 FSEIS.

4.18 NATIVE AMERICANS

No significant impact to Native Americans is anticipated due to this Proposed Interim Operating Criteria for 8.5 SMA Project. The Miccosukee Indians submitted comments on the Preliminary Draft Proposed Interim Operating Criteria for 8.5 SMA Project S-357 Pump Station and were also involved in a stakeholder meeting to discuss issues and potential changes to the plan. Their comments along with USACE response are included in **Section 6**.

4.19 CUMULATIVE IMPACTS

A cumulative impact, according to the Council on Environmental Quality's (CEQ's) NEPA-implementing regulations, is "the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 Code of Federal Regulation [CFR] 1508.7).

The 8.5 SMA is only one component of the MWD Project, which, in turn, is only one component of the ongoing and comprehensive effort to restore the south Florida and Everglades regional ecosystem. The linchpin of this effort is the C&SF Flood Control Project Comprehensive Restudy, now referred to as the CERP. Several other past, current, and future projects that will cumulatively affect the southeast Florida/southern Everglades regional environment are identified below:

TABLE 4-3: PAST, CURRENT AND FUTURE PROJECTS CUMULATIVELY AFFECTING SOUTHEAST FLORIDA

<i>Project</i>	<i>Responsible Agency</i>	<i>Status</i>	<i>Type of Action</i>
Past Actions			
MWD to ENP - Raising Tigertail Camp	ENP / USACE	Complete	Construction
Experimental Program of Water Deliveries to ENP - Test Iterations 1-5 (Shark River Slough)	USACE / SFWMD	Replaced by Test 6	Operations
Experimental Program of Water Deliveries to ENP - Test Iteration 6 (Taylor Slough)	USACE / SFWMD	Replaced by Test 7	Operations
Experimental Program of Water Deliveries to ENP - Test Iteration 7 (modified Taylor Slough)	USACE / SFWMD	Suspended by "jeopardy" opinion on sparrow	Operations
Experimental Program of Water Deliveries - Emergency Deviation from Test Iteration 7, Interim Structural and Operational Plan (ISOP)	USACE / SFWMD	1999, 2000 Seasons	Operations - 2000
Canal-111 - Taylor Slough Bridge Improvements	USACE / SFWMD	Complete - improved conveyance of water down Taylor Slough	Construction
ISOP for Protection of the CSSS	USACE	Superseded by "IOP" 2001	Operations - 2001
S-334 Modifications	USACE	Complete 1996. To provide for structural stability of S-334 for higher water levels in L-29 canal from MWD inflows	Construction
S-355 A&B	USACE	Complete 1997. To move water from WCA 3B to L-29.	Construction

Tiger Tail Camp Raising	USACE	Complete 1998 to mitigate for higher water levels in L-29	Construction
S-356 Pump Station (Part of IOP)	USACE	Complete 2002 to move water from L-28 to L-29 canal	Construction
Radio Towers for S-356 and S-357 (Part of S-331 modifications)	USACE	Complete 2009 to allow for remote operation of the pump stations	Construction
S-333 modifications	USACE	Complete 2007 to account for increase head across the structure.	Construction
Current Actions			
IOP for protection of the CSSS	USACE	Current operational plan	Operations
MWD to ENP - 8.5 SMS	USACE	Approved 2003; Construction complete; Specific operations being developed	Construction of flood mitigation - seepage control
MWD to ENP - Tamiami Trail Modifications	USACE	Plan approved 2008; Design completed 2008	Construction pending solicitation
South Dade (C-111) Project	USACE		Construction
East Coast Buffer/Water Preserve Areas Project	SFWMD	In planning under CERP Broward County WPA	Construction: will reduce stormwater discharge into WCA-3A

Future Actions	
CERP	USACE / SFWMD
COP	USACE Proposed operations for MWD and C-111SD
MWD to ENP - Conveyance and Seepage Control Features Engineering Documentation Report	USACE Proposed in original Modified Waters Proposed construction
ENP General Management Plan	ENP

Collectively all of the above actions are needed to reach the fullest possible rehydration of the southern Everglades. Virtually all of the above actions were incorporated in the CERP analysis. The CERP analysis was designed to consider the entire south Florida ecosystem and in doing so modeled the hydrological conditions of the area on a broad scale. In the analysis of the hydrological modeling, a set of performance measures were applied to ecological targets to determine the restoration benefits of the hydrological improvements. The CERP also made some fundamental assumptions about the future status of the 8.5 SMA and other on-going projects within the ecosystem prior to completing the CERP's modeling. The CERP assumed that the authorized MWD Project and the 8.5 SMA flood mitigation component (Alternative 1) were in place as designed and providing the expected flows to NESRS. No unacceptable adverse environmental impacts were identified. In addition, analysis of the various alternatives proposed for the 8.5 SMA identified no unacceptable adverse environmental impacts. The 8.5 SMA Project does not have a significant effect on the hydrological-ecological restoration targets of the MWD project. These Proposed Interim Operating Criteria for 8.5 SMA Project allow for a limited amount of environmental benefits as well as the flood mitigation protection promised to the 8.5 SMA residents. Moreover, these interim operations are not permanent and are therefore not expected to have a lasting impact on the region. Therefore, the Recommended Plan for the Proposed Interim Operating Criteria for 8.5 SMA Project is expected to have a net beneficial cumulative effect.

4.20 CONFLICTS AND CONTROVERSY

Over the lifetime of both the 8.5 SMA Project and the Mod Waters Project, considerable interest has been generated among the residents of the 8.5 SMA, and both local and regional stakeholders. The USACE continually strives to include all interested parties in its decision making process and will continue to consider all issues raised. The major issues raised during scoping were:

- Potential to over-drain ENP
- Operations of S-356 (later dropped from inclusion in this plan)
- Intent of future operations (CSOP)
- Flood protection versus flood mitigation for 8.5 SMA residents
- Relation of G-3273 constraint to these operations
- Relation of L-29 elevations to these operations
- Potential impact to nearby wetlands

4.21 COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS

Coordination and evaluation of required compliance with specific federal acts, Executive Orders (E.O.) and other policies for the various alternatives was achieved, in part, through the coordination of this document with appropriate agencies and the public. Compliance for many of the environmental

requirements was established with the 2000 FSEIS and is still applicable for this EA.

4.21.1 NATIONAL ENVIRONMENTAL POLICY ACT OF 1969

Environmental information on the project has been compiled and this EA has been prepared in compliance with NEPA. With signing of the Finding of No Significant Impact (FONSI) this EA will be in full compliance with the Act.

4.21.2 ENDANGERED SPECIES ACT OF 1973

Consultation with the FWS occurred for the FSEIS in 2000 and a finding of not likely to adversely affect any listed species was determined. This determination is not expected to change for this Proposed Interim Operating Criteria for 8.5 SMA Project. Consultation was re-initiated with FWS by letter dated September 3, 2008. Coordination with the FWS is ongoing and should be completed before this document is finalized. This project was fully coordinated under the Endangered Species Act and is therefore, in full compliance with the Act. Consultation with National Marine Fisheries Service (NMFS) was not necessary due to project location and impact area.

4.21.3 FISH AND WILDLIFE COORDINATION ACT OF 1958

This project has been coordinated with the FWS. A Coordination Act Report (CAR) in June of 2000 was submitted by the FWS for the 2000 FSEIE. No additional CAR is expected for this EA, however the project will continue to be coordinated with the FWS. This project is in full compliance with the Act.

4.21.4 NATIONAL HISTORIC PRESERVATION ACT OF 1966 (INTER ALIA)

Consultation with the Florida State Historic Preservation Officer (SHPO) was completed in accordance with the National Historic Preservation Act of 1966, as amended, the Archeological and Historic Preservation Act, as amended and E.O. 11593. In a letter dated June 22, 2000, SHPO concurred with the USACE's finding of no historic properties. This coordination was completed for the 2000 FSEIS and will not change for these Proposed Interim Operating Criteria for 8.5 SMA Project.

4.21.5 CLEAN WATER ACT OF 1972

The USACE has applied for and received 401 WQC from the FDEP for the construction of this pump station. The USACE will apply to the FDEP for the 401 WQC from the FDEP to operate this pump station. The Proposed Interim Operating Criteria for 8.5 SMA Project for this pump station is being finalized and will be coordinated with the FDEP for operational approval. A water quality monitoring plan for start up operations of this pump station has already been coordinated with FDEP and has preliminary approval. Final approval of this monitoring plan will be granted with FDEP's issuance of the operations permit. A Section 404b1 analysis is not included in this document as there is no

dredging or filling as part of this project. The project is in compliance with this Act.

4.21.6 CLEAN AIR ACT OF 1972

The USACE has applied to and received all required permits (associated with the diesel powered pump station) from the EPA delegated authorities (DERM and FDEP) with Clean Air Act responsibilities. The project is in compliance with this Act.

4.21.7 COASTAL ZONE MANAGEMENT ACT OF 1972

A federal consistency determination in accordance with 15 CFR 930 Subpart C is included in this report as **Appendix A**. State consistency review will be performed during the coordination of the draft EA.

4.21.8 FARMLAND PROTECTION POLICY ACT OF 1981

Coordination with the Natural Resource Conservation Service (NRCS) was completed for the 2000 FSEIS. The project is in full compliance with this act.

4.21.9 WILD AND SCENIC RIVER ACT OF 1968

No designated wild and scenic river reaches would be affected by project related activities. This act is not applicable.

4.21.10 MARINE MAMMAL PROTECTION ACT OF 1972

The West Indian manatee was identified by the FWS as having a potential to be impacted by this project. The USACE has determined that the project may affect but is not likely to adversely affect the West Indian manatee. The project is in full compliance with this act.

4.21.11 ESTUARY PROTECTION ACT OF 1968

No designated estuary would be significantly impacted by project activities. It is possible that Florida Bay would benefit from the project through less water being released through S-331 and moving south. This project is in full compliance with this act.

4.21.12 RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT, TOXIC SUBSTANCES CONTROL ACT OF 1976

The pump station site has been evaluated for HTRW. Nothing was found (such as abandoned HTRW sites) that would cause CERCLA to be implemented. A limited area on the site was found to have a chlordane spill which was fully remediated before any construction began on this location. This project is in full compliance with these acts.

4.21.13 FEDERAL WATER PROJECT RECREATION ACT

The principles of the Federal Water Project Recreation Act, (PL 89-72) as amended, do not apply to this project.

4.21.14 SUBMERGED LANDS ACT OF 1953

The project would not occur on submerged lands of the State of Florida. This act does not apply.

4.21.15 COASTAL BARRIER RESOURCES ACT AND COASTAL BARRIER IMPROVEMENT ACT OF 1990

There are no designated coastal barrier resources in the project area that would be affected by this project. These acts are not applicable.

4.21.16 RIVERS AND HARBORS ACT OF 1899

The proposed work would not obstruct navigable waters of the United States. The proposed action has been subject to the public notice, public hearing, and other evaluations normally conducted for activities subject to the act. The project is in full compliance.

4.21.17 ANADROMOUS FISH CONSERVATION ACT

Anadromous fish species would not be affected by this project. This act is not applicable.

4.21.18 MIGRATORY BIRD TREATY ACT AND MIGRATORY BIRD CONSERVATION ACT

No migratory birds would be adversely affected by project activities. The project would be in compliance with these acts upon review of this EA by the FWS.

4.21.19 MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT

The term "dumping" as defined in the Act (33 U.S.C. 1402)(f) does not apply to this project. Therefore, the Marine Protection, Research and Sanctuaries Act does not apply.

4.21.20 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

This project is inland and not expected to adversely affect EFH. Full compliance with the Act would occur upon review of this EA by the NMFS.

4.21.21 E.O. 11990, PROTECTION OF WETLANDS

This project is in compliance with the goals of this E.O.

4.21.22 E.O. 11988, FLOOD PLAIN MANAGEMENT

This E.O. instructs federal agencies to avoid development in flood plains to the maximum extent feasible. The current project is not a “development” but rather a part of a larger restoration plan. This project is in compliance.

4.21.23 E.O. 12898, ENVIRONMENTAL JUSTICE

E.O. 12989 provides that each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority or low-income populations. The project would not result in disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. The Proposed Interim Operating Criteria for 8.5 SMA Project will serve to mitigate any potential flooding impacts to residents in the 8.5 SMA. This project is being developed consistently with this E.O. and is in compliance with this Act.

4.21.24 E.O. 13089, CORAL REEF PROTECTION

No coral reefs would be impacted by this project. This E.O. does not apply.

4.21.25 E.O. 13112, INVASIVE SPECIES

The Proposed Interim Operating Criteria for 8.5 SMA Project would have no significant impact on invasive species. The project is in compliance with the goals of this E.O.

5.0 LIST OF PREPARERS

TABLE 5-1: PREPARERS

Name	Organization	Role in EA	Email address
Barbara Cintron	USACE Jacksonville	Biologist	Barbara.b.cintron@usace.army.mil
Susan Conner	USACE Jacksonville	Biologist	Susan.l.conner@usace.army.mil
Dan Crawford	USACE Jacksonville	Hydrology/ Modeling	Daniel.E.Crawford@usace.army.mil
Robert Evans	USACE Jacksonville	Hydrology/ Modeling	Robert.A.Evans@usace.army.mil
Trent Ferguson	USACE Atlanta	Hydrology/ Operations	Trent.L.Ferguson@usace.army.mil
Andrew Geller	USACE Jacksonville	Hydrology/ Operations	Andrew.E.Geller@usace.army.mil
Gwen Nelson	USACE Jacksonville	Engineer/ Construction	Gwendolyn.J.Nelson@usace.army.mil
Jim Riley	USACE Jacksonville	Water Quality/ HTRW Engineer	James.M.Riley@usace.army.mil
Anya Savage	USACE Jacksonville	Biologist	Anya.m.Savage@usace.army.mil
Devona Sherwood	EPJV Jacksonville	Project Management	Devona.B.Sherwood@usace.army.mil
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6.0 PUBLIC INVOLVEMENT

6.1 SCOPING AND DRAFT EA

A public meeting was held on January 31, 2008 in Miami to discuss the Preliminary Draft Proposed Interim Operating Criteria for the 8.5 SMA Project. The meeting was advertised in newspapers including the Miami Herald, El Nuevo Herald, and Diario Las Americas on Friday January 25, 2008. The meeting announcement was posted on www.evergladesplan.org in the January 2008 events calendar, the news area and the public meeting area. In addition it was posted to the 8.5 SMA area of the USACE Jacksonville website. An e-notice regarding availability of the Proposed Interim Operating Criteria for 8.5 SMA Project was sent to about 2,000 people. Public and agency comments were accepted on the Draft Proposed Interim Operating Criteria for the 8.5 SMA Project until March 3, 2008. The public and agency comments received are included in **Appendix B**. A matrix of the comments and responses are included in **Section 6.4** below. The comments received were compiled and discussed at an inter-agency sub-team meeting (which resulted in changes to the plan) held on April 25, 2008 which included ENP, FWS, USACE, Miccosukee Tribe, FDACS, and SFWMD.

6.2 AGENCY COORDINATION

Because of the magnitude of USACE efforts underway to implement the various components of the MWD Project, as well as its ongoing responsibilities with the existing C&SF Project, USACE is in continuous coordination with other federal and state resource agencies, business organizations, environmental organizations, and private citizens groups. Previous related coordination undertaken for the 8.5 SMA component of the MWD Project is included in the 2000 FSEIS. A letter was sent to FWS dated September 3, 2008, requesting coordination for this EA. Comment letters on the Preliminary Draft Proposed Interim Operating Criteria for the 8.5 SMA Project were received from the following agencies: Department of the Interior (DOI), Miccosukee Tribe of Indians, FDACS, FDOT, SFWMD and FWC.

6.3 LIST OF RECIPIENTS

Copies of the draft EA will be available on the Jacksonville District 8.5 SMA website:

<http://www.saj.usace.army.mil/Divisions/Everglades/Branches/ProjectExe/Sections/LECSW/MWD/8-5SMA.htm>

Copies of the draft EA were mailed to the following parties:

Native American Tribes

Miccosukee Tribe of Indians

Muscogee (Creek) Nation of Oklahoma

Poarch Creek Indians
Seminole Tribe of Florida
Seminole Nation of Oklahoma

Federal Agencies

Federal Emergency Management Agency
National Center for Environmental Health
US Department of Agriculture
 US Forest Service
US Department of Commerce
 National Oceanic and Atmospheric Administration
 Florida Keys National Marine Sanctuary
 National Marine Fisheries Service
US Department of Housing and Urban Development
US Department of the Interior
 Bureau of Indian Affairs
 National Park Service
 Biscayne National Park
 Everglades National Park
 US Fish and Wildlife Service
 US Geological Survey
 Office of Environmental Policy and Compliance
US Department of Justice
US Department of Transportation
 Federal Highway Administration
US Environmental Protection Agency

Federal Government

US Congressmen
 Florida Districts 17, 18, 21, 25
US Senators, Florida

State Agencies

Florida Department of Agriculture, Office of Agricultural Water Policy
Florida Department of Environmental Protection
Florida Department of Transportation
Florida Fish and Wildlife Conservation Commission
Florida Keys Aqueduct Authority
Florida State Clearinghouse
South Dade Soil and Water Conservation District
South Dade Government Center
South Florida Regional Planning Council
Southwest Florida Regional Planning Council
South Florida Water Management District
State Historic Preservation Office
University of Florida Cooperative Extension Office, Homestead, Florida

State Government

Governor's Office

State Representatives

Districts 102, 103, 104, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116,
117 118, 119, 120

State Senators

Districts 33, 34, 35, 36, 38, 39, 40

County Agencies

Miami-Dade County Department of Environmental Resources Management

Miami-Dade County Park & Recreation

Miami-Dade County Water & Sewer

Miami-Dade Water Resources

County Government

Miami-Dade County Board of Commissioners

Municipalities

City of Florida City

City of Homestead

Miami-Dade City Planning Department

Libraries

Miami-Dade Public Library, Homestead Branch

Miami-Dade Public Library, Main Branch

Post Offices

Florida City Post Office

Homestead Post Office

Groups and Organizations

Airboat Association of Florida

Audubon of Florida

Audubon of the Everglades

Broward County Airboat Association

Clean Water Action

Coopertown Airboat

Dade County Farm Bureau

Environmental & Land Use Law Center

Everglades Coordinating Council

Everglades Foundation

Everglades Protection

Florida Atlantic University

Florida Biodiversity Project

Florida International University

Florida Keys Fishing Guides
Florida Wildlife Federation
Friends of the Everglades
Homestead/Florida City Chamber of Commerce
Izaak Walton League
National Parks Conservation Association
Natural Resources Defense Council
The Nature Conservancy
Reef Relief
Sierra Club
Sierra Club of South Florida
Sierra Club, Miami Group
South Florida Ecosystem Restoration Task Force
Trail Glades Bassmasters
The United Property Owners of the 8.5 Square Mile Area
World Wildlife Fund

Businesses

Florida Power and Light
Everglades Research Group, Inc
Everglades Safari
Gator Park
Lehtinen, Vargas and Riedi
Lewis, Longman and Walker
MacVicar, Frederico and Lamb
Milian-Swain and Associates
Radio One, Pepper Hamilton
South Dade News Leader

Individuals

A list of individuals who received the Draft EA is on file in the Jacksonville District of the USACE.

6.4 COMMENTS RECEIVED AND RESPONSE

The following comments were received on the Preliminary Draft Proposed Interim Operating Criteria for the 8.5 SMA Project presented at a public meeting in January 2008. The comments were collected and discussed at an inter-agency subteam meeting held on April 25, 2008 that resulted in changes to the plan. The responses provided below describe how the comments were addressed and if the Proposed Interim Operating Criteria for 8.5 SMA Project was subsequently amended.

6.5 COMMENTS RECEIVED AND RESPONSES

TABLE 6-1: COMMENTS RECEIVED AND RESPONSE

Commenter	Comment	Response
US Department of the Interior	The proposed interim operating criteria should affirmatively emphasize that the purpose of the operations of S-357 is to provide flood mitigation for flooding impacts within the 8.5 SMA resulting from implementation of the MWD Project, not to provide flood protection over and above this mitigation in ways that are detrimental to ENP. The draft plan states that the operation of S-357 <i>should</i> not adversely impact the restoration levels of the ENP hydrology (emphasis added). The Department believes that the operation of S-357 <i>must</i> not adversely impact the hydrology in ENP.	The pumping capacity limitation was set at 500 acre-feet per day so that overdrainage does not occur. Monitoring of nearby gages will occur to ensure no adverse impact to the hydrology of ENP.
	As these proposed operations to mitigate for MWD impacts are being provided to the 8.5 SMA prior to the increased flows to NESRS, the Department recommends the draft plan take an adaptive approach by slightly adjusting the pumping triggers and implementing an appropriate monitoring plan so that the adjustments can be considered, as necessary. We recommend raising the trigger level that would initiate pumping from 5.2 feet to 5.4 feet, but still allow the pumps to continue to pump down to 4.9 feet.	A list of monitoring gages is included in the EA. These gages will be monitored to ensure negative impacts are not occurring. If negative impacts do occur, an adaptive management approach will be used to modify the pumping operations.
	It is important to the Department that the S-356 pumps be operated consistent with restoration goals. The specific Initial Operating Plan (IOP) operations referenced in this proposed interim operating criteria for S-356 should be included in the draft plan, as well as the intent of these operations.	The operations for the S-356 pump were removed from this proposed interim operating criteria.
	The operations at S-331 that are described in this draft plan should also include the operational intent language for that structure. For example, the triggers for S-331 operations are associated with water levels in the seepage canal and are necessary at this time because the C-111 detention areas are not fully completed. However, when these detention areas are completed, the Department understands	Future actions will be discussed and recorded in a separate NEPA document. These operations would be defined in COP.

	that S-331 flood control operations will be based on the S-331 head water levels developed for the proposed Combined Structural and Operations Plan (CSOP) and would no longer be triggered by water level in the seepage canal. This intent should be clearly expressed in this proposed interim operating criteria.	
	The FWS (Service) is currently collecting scientific data regarding optimum hydrologic conditions for snail kites and apple snails in Water Conservation Area 3A. The Service would like to explore with the USACE and our other partners the best ways to use the proposed operations and operational flexibility inherent in the Central and Southern Florida Project to move us towards achieving these optimum hydrologic conditions in this area of critical concern.	We look forward to working with you in this area.
Everglades National Park—South Florida Natural Resources Center	A central issue with the Proposed Interim Operating Criteria for the 8.5 SMA Project S-357 Pump Station is that the Plan will provide the full level of flood control benefits <u>prior</u> to increased inflows to NESRS. The federal government position up to this time has been that the 8.5 SMA water control features were authorized to mitigate the impacts of the increased inflows to NESRS under the MWD project, not to provide flood protection to the area.	As a result of concerns raised during scoping, the pumping capacity was limited to 500 acre-feet per day.
	If the current proposal is adopted, Everglades National Park desires a level of assurance that when NESRS water levels are actually increased, the operational Plan will not be adjusted by further lowering of stag triggers that control water management in the 8.5 SMA.	The proposal presented in January has been edited significantly. Water management will continue to be governed by IOP until such time as COP is authorized.
	Once the C-111 detention areas are fully built out, operational flexibility should be made to take full advantage of the connection of the 8.5 SMA system to these features. At that time, the S-357 detention cell will be able to discharge into this system. Therefore, S-331 should no longer triggered by the gage in the seepage canal, and S-331 would respond only to its head water trigger. Everglades National Park desires a level of assurance on this future condition as well.	Water management will continue to be governed by IOP until such time as COP is authorized.
	It is difficult to evaluate the issue of flood mitigation	This proposed

	v. flood protection quantitatively, since there has been no modeling on the proposed operational plan, and no NEPA review is proposed to evaluate its impacts. Particular concern should be highlighted concerning the lack of quantitative technical evaluations in the context of this modification to the Interim Operational Plan, since the IOP was presented with a lawsuit over technical issues early in its implementation.	interim operating criteria is not a modification to the IOP – it is an incorporation into IOP in order to include interim operations for S-357. The proposed interim operating criteria was formulated and states explicitly that it is for flood mitigation and will not be used for flood protection.
The Florida Department of Agriculture and Consumer Services	The G-3273 constraint on operating S-333 should not be removed until all the permits needed to operate S-356 per the operational protocol proposed in the Combined Structural and Operational Plan (CSOP) are obtained.	The G-3273 constraint will not be removed as part of this proposed interim operating criteria.
	The removal of the S-356 Pump station along with the removal of the G-3273 constraint in the Preliminary Draft – Proposed Interim Operating Criteria For 8.5 SMA Project Pump Station S-357 is unexpected and unacceptable.	The S-356 operations and removal of the G-3273 constraint are no longer included as part of this proposed interim operating criteria.
Florida Department of Transportation	It appears that the operations of the S-357 pump station will occur prior to any modifications to Tamiami Trail. Water levels should not be raised above 7.5' in the L-29 until roadway modifications to protect the integrity of Tamiami Trail have been completed unless otherwise approved by the FDOT for short duration events.	Water management will continue to be governed by IOP until such time as COP is authorized. We would be happy to discuss these operations with you at any time.
National Parks Conservation Association	Because of the currently-proposed Modified Water Delivery Project (“Mod Waters”)’s inability to raise water levels in L29 to the levels envisioned in the June 1992 GDM and in the July 2000 EIS for the 8.5 SMA Project, the operations proposed here represent	Due to public comments and potential controversy, the S-356 operations and

, National Resources Defense Council, Everglades Foundation	a significant over-mitigation for the level of environmental benefits currently anticipated in Mod Waters.	removal of the G-3273 constraint, as well as modifications to the L29 BC constraint, are no longer included as part of this proposed interim operating criteria. In addition the pumping capacity of S-357 is limited to 500 acre-feet per day.
	<p>Given that the quantities of additional water to be delivered by the current design of Mod Waters are much lower than originally projected, we are concerned by the first sentence of Section 7-04 (page 4), which states:</p> <p>“The levee and seepage collection canal are designed to mitigate for increased flood risk as a result of projected increased water levels in North East Shark River Slough (NESRS) and other portions of the MWD Project.”</p> <p>... This statement must be modified to reflect both the actual design condition and to make it clear that the S-357 levee and seepage collection system represent the mitigation for a fully restored, post-CERP water levels in Northeast Shark Slough, i.e., “...projected increased water levels in NE Shark River Slough due to Mod Waters and all <u>other restoration projects</u>.” Prior to such restored water levels, the S-357 levee and seepage collection should be limited in use to the extremely minimal impacts of the currently-proposed Mod Waters, if and when implemented.</p>	Due to public comments and potential controversy, the S-356 operations and removal of the G-3273 constraint, as well as modifications to the L29 BC constraint, are no longer included as part of this proposed interim operating criteria. In addition the pumping capacity of S-357 is limited to 500 acre-feet per day.
	<p>Section 7-05.1 states</p> <p>“Operation of S-357 should not adversely impact the restoration levels of the ENP hydrology. A monitoring, evaluation, and reporting program shall be implemented to ensure operations are consistent with the anticipated level of service.”</p> <p>This statement lacks specificity, and does not provide the necessary assurances that the project will not adversely affect wetlands</p>	<p>The pumping capacity limitation was set at 500 acre-feet per day so that overdrainage does not occur.</p> <p>Monitoring of nearby gages will occur to ensure no</p>

		adverse impact to the hydrology of ENP.
	Our fourth comment is related to the operations of S-356 in Section 7-05.1.4 on page 9.	The operations for the S-356 pump were removed from this proposed interim operating criteria.
	Prior to operation of the S-357 and associated structures, the Corps must obtain a permit issued pursuant to Section 402 of the CWA. In addition, the Corps must evaluate whether operation of the structures will meet state water quality standards and assure such compliance; as the Corps is aware, ENP is classified as an Outstanding Florida Water.	The Corps will obtain all necessary permits (with accompanying analysis) for this pump before it is operated. A comprehensive start up water quality monitoring plan has been coordinated with FDEP to evaluate the quality of the water being routed into the detention cell and characterize the water within the detention cell. No surface water discharges onto ENP lands are allowed by this plan. That means no overflow of the southern most weirs in the detention cell. The detention cell's southeastern overflow weir is approximately 1,000 ft from the ENP boundary
	We believe that the Corps has missed an opportunity to apply some of the more forward-thinking and progressive elements of the "Draft Operations Manuals" that were proposed as part of the	Water Control Plan (which will result from these proposed interim operating

	Guidance Memoranda for CERP. Even though this is a pre-CERP project, this document would be greatly improved by following the format spelled out there, with increased attention to operational philosophies and objectives. This current document, which follows the traditional format, contains the elements of future controversies because of its adherence to outdated templates.	criteria) preparation is pursuant to Engineering Regulation 1110-2-240, and is in accordance with guidance contained in Engineering Manual 1110-2-3600 and Engineering Regulation 1110-2-8156.
Florida Fish and Wildlife Conservation Commission	We encourage the COE to seek a more solid agreement with FDOT concerning the 7.5-foot stage constraint in the L-29 canal to be raised to a minimum of 8.0 feet NGVD for sustainable periods. This higher stage would provide greater relief for WCA-3 during high water events, and improve the distribution of flows to NESRS, benefiting Everglades' flora and fauna in both areas.	Consultation between USACE and FDOT are ongoing concerning this issue.
	We are uncertain as to the effects that the proposed interim operating criteria will have on existing wetlands located outside of the seepage canal, and ask that the COE continue to collect hydrological data from appropriate existing monitoring well (Angel's well, etc.), as well as evaluate the need to add additional wells, if deemed necessary. If the hydrological data indicate additional drying of these wetlands is occurring, then the COE should revise the proposed interim operating criteria to alleviate the adverse effects.	Concur.
	The proposed operations for the S-357 pump station are likely to create suitable habitat for shorebirds and other wildlife in the 8.5 SMA detention cell. Recreational opportunities for bird watchers, hunters, and anglers should given serious consideration, pursuant to Florida Statute 373.1391(1). These recreational opportunities are compatible with project purposes and there is a high stakeholder demand for additional recreational opportunities in this area of southern Florida. As such, any additional opportunities would be greatly appreciated by stakeholders and would reflect favorably on the COE for supporting them.	The USACE supports all recreation that is compatible with the project. However, the operations of the pump station and detention cell will be turned over to SFWMD who will make the decision on any recreational usage of the facilities.

Audubon of Florida	While we understand the importance of mitigation and flood control, we feel that this Control Plan has over-emphasized the need for mitigation at this time. Although the modified water deliveries project (“MWD”) will not result in movement of a large amount of water for the foreseeable future, this mitigation plan assumes the water levels found in the June 1992 GDM and in the July 2000 EIS for the 8.5 Square Mile Area project. Such high levels of mitigation should be reserved for a time when Tamiami Trail will be significantly modified.	The pumping capacity limitation was set at 500 acre-feet per day so that overdrainage does not occur. In addition, flexibility in operations of S-331 will allow operators to maximize benefits while providing the appropriate flood mitigation. Monitoring of nearby gages will occur to ensure no adverse impact to the hydrology of ENP. As additional project features have been built (levees), it is important that any change in hydrology that might occur due to the project can be mitigated.
	Additionally, as the Control Plan’s stated purpose is to provide mitigation for flood risk caused by increased water levels in Northeast Shark River Slough, and for other portions of the WMD project, it may open the door for additional mitigation as other CERP projects progress, thus resulting in increased flood control measures above and beyond what is needed. Simply indicating that the Control Plan’s purpose is to provide mitigation for all other CERP projects will make it clear that the S-357 levee and seepage collector system represent the mitigation for fully restored, post-CERP water levels in Northeast Shark Slough and will ensure that this Control Plan does not lead to future roadblocks for other CERP components.	We believe this document and past documents and authorizations clearly state the intent of Mod Waters and CERP.
Miccosukee	Revised Interim Operating Plan (IOP) requires a	The change in the

e Tribe of Indians	<p>SEIS.</p> <p>The S-357 pump is not part of the IOP operating criteria that was analyzed in the December 2006 SEIS that the Court ordered the Corps to conduct. There are other significant differences between IOP and the Interim Plan that require review in an SEIS. Under IOP, there was a 9 ft. constraint on the L-29 canal, and 7.5 ft. is proposed under the Interim Plan. Also, the capacity of the S-333 was to be increased under IOP, which has not happened here. This will inhibit the ability to get water out of WCA 3A and create significant adverse impacts there. If the Corps in modifying IOP to include a new structure that will significantly impact the human environment, it must conduct an SEIS on its revised plan.</p>	<p>L-29 stage constraint was removed from this proposed interim operating criteria. This EA analyzes the potential environmental impacts of the Proposed Interim Operating Criteria for 8.5 SMA Project S-357 Pump Station and is intended to be an incorporation into IOP. It does not change IOP.</p>
	<p>The S-356 structure is part of the Modified Water Deliveries Project (“Mod Waters”), which is not yet fully constructed. By prematurely operating segments of Mod Waters in a manner that harms WCA 3A, the Corps is violating the intent of Congress, and by not analyzing the environmental impacts of doing so, the Corps is improperly segmenting the action and violating NEPA.</p>	<p>The operations for the S-356 pump were removed from this proposed interim operating criteria.</p>
	<p>The goal of Mod Waters was to benefit 600,000 acres of Everglades wetlands by restoring the natural flow of water through the Everglades and into Northeast Shark River Slough. Operation of the S-356 pump with a 7.5 ft elevation limit, and without the entire project being implemented, will not benefit Tribal Everglades in Water Conservation Area 3A, which was a Mod Waters project goal. Instead, the Interim Plan will push water against its natural flow direction away from agricultural and urban areas toward the Miccosukee Reserved Area. This will decrease the capacity to remove water from WCA 3A, thus further exacerbating the damage being done to tree islands, the Snail Kite and its critical habitat there.</p>	<p>The operations for the S-356 pump were removed from this proposed interim operating criteria.</p>
	<p>It is the Tribe’s understanding that people still live east of the levee in the 8.5 SMA, and farther east in the Everglades National Park Expansion Area who could be adversely impacted by these operations. Putting more water into Northeast Shark River Slough will potentially increase flooding in these</p>	<p>The Proposed Interim Operating Criteria for 8.5 SMA Project S-357 Pump Station will mitigate by</p>

	areas. The flooding potential must be analyzed in an EIS.	providing the same level of flood protection as existed before these projects.
	Operation of the S-356 pump under the current interim plan will cause higher stages/durations in WCA 3A and harm the endangered Snail Kite. The draft interim plan will exacerbate the damage being caused to the Snail Kite and its habitat in WCA 3A caused by closing most of the S-12 gates nine months a year under IOP. Implementation of the Interim Plan in a manner that adversely affects the Snail Kite and adversely modifies its critical habitat in WCA 3A, will violate the Endangered Species Act.	The operations for the S-356 pump were removed from this proposed interim operating criteria.
	The Corps does not have the Department of Environmental Protection (“DEP”) permits required to operate the S-355A, S-355B, S-356 and possibly other structures that are part of the draft Interim Plan. A permit has been pending for the S-356 since 2000 but has not been granted. The Corps cannot operate without obtaining these permits. Moreover, the Corps must analyze the water quality impacts of the draft Interim Plan in an EIS under NEPA.	The operations for the S-356 pump were removed from this proposed interim operating criteria.
	The Corps owes the Miccosukee Tribe of Indians a Trust obligation and fiduciary duty to protect tribal lands, resources, and assets pursuant to the federal Indian Trust Doctrine. This Trust obligation and fiduciary responsibility under the Indian Trust Doctrine extends protection to Tribal lands, resources and assets recognized in the Florida Indian Land Claims Settlement Act, P.L.97339. This law established a Federal Miccosukee Indian Reservation and a perpetual lease in the area the Everglades adversely impacted by IOP. The Corps is aware that Tribal lands within WCA 3A are being degraded and destroyed by the Corps’ IOP. Despite knowing the devastating impact that these water management actions have had on Tribal lands in WCA 3A, the Corps is considering implementing a draft Interim Plan that will make these conditions even worse. The Corps failed to conduct meaningful consultation on the Interim Plan with the Tribe prior to issuing the Draft. Nor has the Corps conducted modeling to show what the impacts will	The operations for the S-356 pump were removed from this proposed interim operating criteria. In addition, the comments received were compiled and discussed at an inter-agency sub-team meeting (which resulted in changes to the plan) held on April 25,. The proposed operating criteria is in the EA. The Corps will begin writing the full water control plan

	be on Tribal lands. The Tribe asks the Corps to consider viable alternative operational plans that would alleviate the high water conditions in WCA 3A or the expeditious implementation of the Modified Water Deliveries Project that would be beneficial to all parts of the system.	after public comments.
Madeline Fortin	Despite this the Corps continues to maintain that they do not have to provide the remaining community with flood protection, but only with “flood mitigation” without ever defining what flood mitigation actually is.	The Proposed Interim Operating Criteria for 8.5 SMA Project S-357 Pump Station will mitigate by providing the same level of flood protection as existed before these projects.
	The agency has refused to state clearly what level of groundwater constitutes “...the same levels as existed prior to the implementation of the MWD Project” This lack of a clearly defined goal for groundwater levels allows the Corps to keep groundwater at any level they choose.	Regional gages will be compared to identify differences in water levels inside and outside of the 8.5 SMA levees.
	The Corps continues this section with the following statement “Two interior levees, one on either side of the seepage canal, are positioned to prevent surface water from entering the seepage canal.” It appears that the Corps is intending to flood the community since they have designed the central portion of the project to deal with water above the surface of the ground. The only way there would be surface water near the canal is if the entire community were flooded. Surface water=flooding.	The C-357 is designed to collect surface and groundwater. By collecting groundwater the surface water will be reduced. The purpose of the two interior levees is to help control soil erosion and reduce the undesirable direct stormwater runoff from the lands adjacent to the canal. Infiltration of the surface water versus direct stormwater runoff is expected to improve the

		seepage canal's water quality.
	This section ends with the statement that the S-357 pump ".will discharge seepage water into the flowway to the 8.5 SMA detention cell to be released south into a treatment area in the C-111 project area. Discharges out of the STA [detention cell] will not be allowed until the C-111 Northern Detention Area (NDA) is constructed." This statement is flawed in a number of ways.	The statement quoted is correct. This interim plan discusses that the water will be pumped in the 8.5 SMA detention cell under this interim plan. Once the C-111 NDA is constructed the water can be released into that area.
	Despite what the Corps says in this draft proposed interim operating criteria, once water has been pumped into the impoundment areas it will not flow south overland.... downstream canal levels in L-31 North canal will be used as an excuse not to use the S-331 or S-357 pumps.	The operations described in the proposed interim operating criteria will be followed by the operators.
	Downstream capacity could be easily created by opening gates downstream of S-331-but then the Corps and the SFWMD would not be able to flood our helpless community. There is no reason to expect that the operation of S-357 will be any different.	The objective of the proposed interim operating criteria is to maintain the surface and groundwater levels between L-357W and L-31 N (within the 8.5 SMA) at the same levels expected prior to the implementation of any MWD components, while preserving hydroperiods near the 8.5 SMA.
	If water levels in the seepage canal are allowed to get as high as 6.0 feet NGVD, there is no reason not	The objective of the proposed

	<p>to expect that ground water levels could be as much as 3 feet higher meaning that most of the remaining community could have water levels of 9 feet NGVD. This would result in much of the remaining community being flooded for months at a time.</p>	<p>interim operating criteria is to maintain the surface and groundwater levels between L-357W and L-31 N (within the 8.5 SMA) at the same levels expected prior to the implementation of any MWD components, while preserving hydroperiods near the 8.5 SMA.</p>
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APPENDIX A
COASTAL ZONE MANAGEMENT CONSISTENCY

FLORIDA COASTAL ZONE MANAGEMENT PROGRAM FEDERAL CONSISTENCY EVALUATION PROCEDURES

1. Chapter 161, Beach and Shore Preservation. The intent of the coastal construction permit program established by this chapter is to regulate construction projects located seaward of the line of mean high water and which might have an effect on natural shoreline processes.

Response: There is no construction as part of this project.

2. Chapters 163(part II), 186, and 187, County, Municipal, State and Regional Planning. These chapters establish the Local Comprehensive Plans, the Strategic Regional Policy Plans, and the State Comprehensive Plan (SCP). The SCP sets goals that articulate a strategic vision of the State's future. It's purpose is to define in a broad sense, goals, and policies that provide decision-makers directions for the future and provide long-range guidance for an orderly social, economic and physical growth.

Response: The proposed project has been coordinated with various Federal, State and local agencies during the planning process. The project meets the primary goal of the State Comprehensive Plan through preservation and protection of the environment.

3. Chapter 252, Disaster Preparation, Response and Mitigation. This chapter creates a state emergency management agency, with the authority to provide for the common defense; to protect the public peace, health and safety; and to preserve the lives and property of the people of Florida.

Response: The proposed project involves a proposed interim operating criteria for S-357 Pump Station. It will serve to provide flood protection mitigation for the residents of the 8.5 SMA. Therefore, this project would be consistent with the efforts of Division of Emergency Management.

4. Chapter 253, State Lands. This chapter governs the management of submerged state lands and resources within state lands. This includes archeological and historical resources; water resources; fish and wildlife resources; beaches and dunes; submerged grass beds and other benthic communities; swamps, marshes and other wetlands; mineral resources; unique natural features; submerged lands; spoil islands; and artificial reefs.

Response: The proposed interim operating criteria for 8.5 SMA Project S-357 Pump Station would provide flood protection mitigation for the residents of the 8.5 SMA. There is no dredge or fill as part of this project. The proposed project would comply with the intent of this chapter.

5. Chapters 253, 259, 260, and 375, Land Acquisition. This chapter authorizes the state to acquire land to protect environmentally sensitive areas.

Response: Since the pump station is already built and the affected property is already in public ownership, this chapter does not apply.

6. Chapter 258, State Parks and Aquatic Preserves. This chapter authorizes the state to manage state parks and preserves. Consistency with this statute would include consideration of projects that would directly or indirectly adversely impact park property, natural resources, park programs, management or operations.

Response: The proposed project is not located on park lands. However, ENP is located directly to the west. This proposed interim operating criteria will not adversely impact and may provide some hydrologic benefits to ENP. The project is consistent with this chapter.

7. Chapter 267, Historic Preservation. This chapter establishes the procedures for implementing the Florida Historic Resources Act responsibilities.

Response: This project has been coordinated with the State Historic Preservation Officer (SHPO). Historic Property investigations were conducted in the project area. An archival and literature search, in addition to a magnetometer survey of the proposed borrow area were conducted. The SHPO concurred with the USACE determination that the proposed project will not adversely affect any significant cultural or historic resources. The project is consistent with the goals of this chapter.

8. Chapter 288, Economic Development and Tourism. This chapter directs the state to provide guidance and promotion of beneficial development through encouraging economic diversification and promoting tourism.

Response: The project may have some recreational benefits (dependant on the SFWMD management of the area). This would be compatible with tourism for this area and therefore, is consistent with the goals of this chapter.

9. Chapters 334 and 339, Transportation. This chapter authorizes the planning and development of a safe balanced and efficient transportation system.

Response: No public transportation systems would be impacted by this project.

10. Chapter 370, Saltwater Living Resources. This chapter directs the state to preserve, manage and protect the marine, crustacean, shell and anadromous fishery resources in state waters; to protect and enhance the marine and estuarine environment; to regulate fishermen and vessels of the state engaged in

the taking of such resources within or without state waters; to issue licenses for the taking and processing products of fisheries; to secure and maintain statistical records of the catch of each such species; and, to conduct scientific, economic, and other studies and research.

Response: No saltwater resources should be impacted by these proposed interim operating criteria, therefore the project is consistent with the goals of this chapter.

11. Chapter 372, Living Land and Freshwater Resources. This chapter establishes the Game and Freshwater Fish Commission and directs it to manage freshwater aquatic life and wild animal life and their habitat to perpetuate a diversity of species with densities and distributions which provide sustained ecological, recreational, scientific, educational, aesthetic, and economic benefits.

Response: The project will provide not negatively impact freshwater aquatic life or wild animal life. The project is consistent with the goals of this chapter.

12. Chapter 373, Water Resources. This chapter provides the authority to regulate the withdrawal, diversion, storage, and consumption of water.

Response: These proposed interim operating criteria are intended to provide flood protection mitigation to the residents of the 8.5 SMA. It may also provide some secondary environmental benefits. The project is consistent with the goals of this chapter.

13. Chapter 376, Pollutant Spill Prevention and Control. This chapter regulates the transfer, storage, and transportation of pollutants and the cleanup of pollutant discharges.

Response: This chapter is not applicable as no storage or transfer of pollutants will result from the project.

14. Chapter 377, Oil and Gas Exploration and Production. This chapter authorizes the regulation of all phases of exploration, drilling, and production of oil, gas, and other petroleum products.

Response: This project does not involve the exploration, drilling or production of gas, oil or petroleum product and therefore, this chapter does not apply.

15. Chapter 380, Environmental Land and Water Management. This chapter establishes criteria and procedures to assure that local land development decisions consider the regional impact nature of proposed large-scale development. This chapter also deals with the Area of Critical State Concern program and the Coastal Infrastructure Policy.

Response: The proposed interim operating criteria will not have any regional impact on resources in the area. Therefore, the project is consistent with the goals of this chapter.

16. Chapters 381 (selected subsections on on-site sewage treatment and disposal systems) and 388 (Mosquito/Arthropod Control). Chapter 388 provides for a comprehensive approach for abatement or suppression of mosquitoes and other pest arthropods within the state.

Response: The project will not further the propagation of mosquitoes or other pest arthropods.

17. Chapter 403, Environmental Control. This chapter authorizes the regulation of pollution of the air and waters of the state by the Florida Department of Environmental Regulation (now a part of the Florida Department of Environmental Protection).

Response: A Draft Environmental Assessment addressing project impacts has been prepared and will be reviewed by the appropriate resource agencies including the Florida Department of Environmental Protection. Environmental protection measures will be implemented to ensure that no lasting adverse effects on water quality, air quality, or other environmental resources will occur. Water Quality Certification will be sought from the State prior to construction. The project complies with the intent of this chapter.

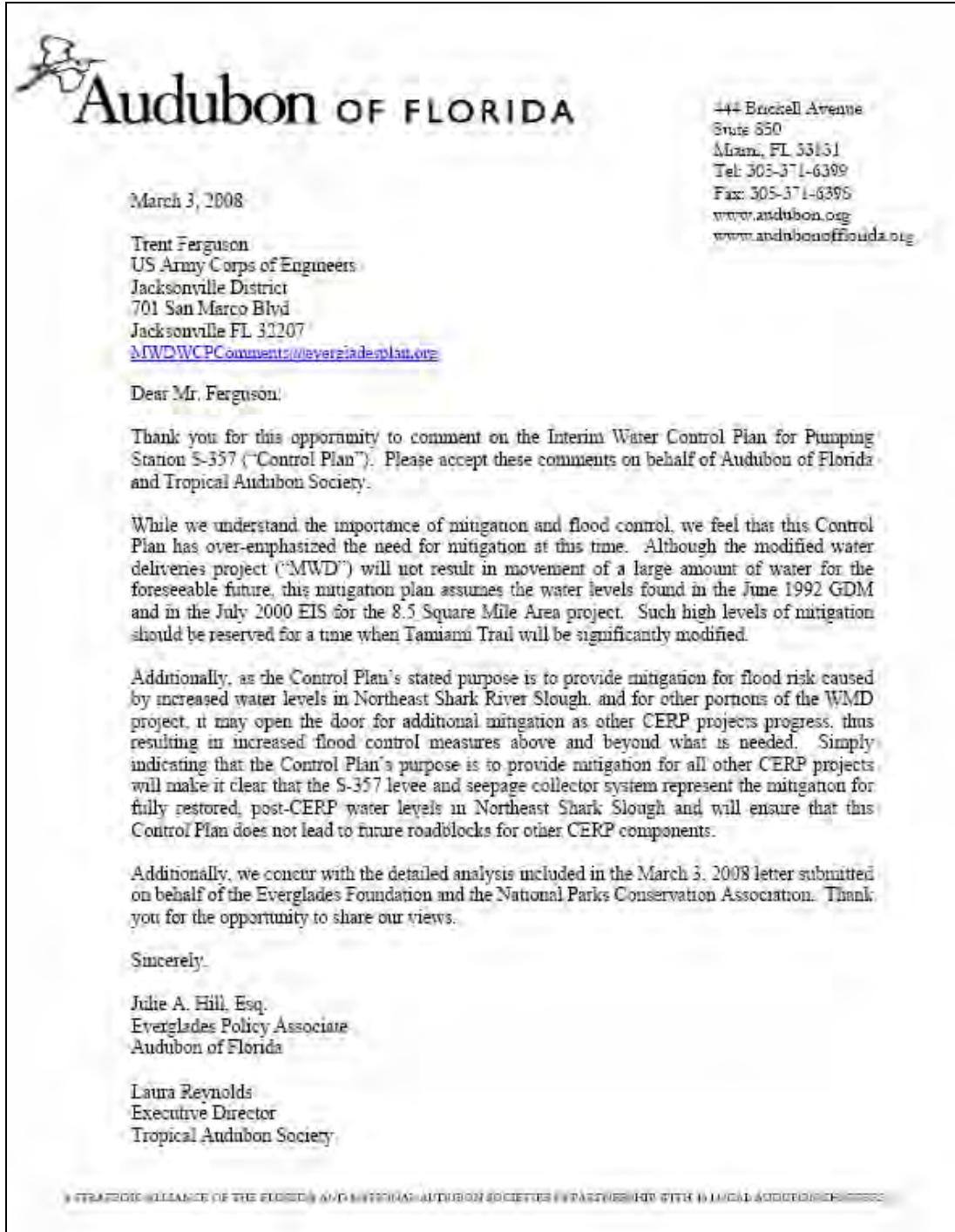
18. Chapter 582, Soil and Water Conservation. This chapter establishes policy for the conservation of the state soil and water through the Department of Agriculture. Land use policies will be evaluated in terms of their tendency to cause or contribute to soil erosion or to conserve, develop, and utilize soil and water resources both onsite or in adjoining properties affected by the project. Particular attention will be given to projects on or near agricultural lands.

Response: The proposed interim operating criteria would not cause or contribute to soil erosion and is part of the larger MWD project to better utilize water resources in the region. The project complies with the intent of this chapter.

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APPENDIX B

PUBLIC AND AGENCY COORDINATION

Pertinent Correspondence:



Florida Department of Agriculture and Consumer Services
CHARLES H. BRONSON, Commissioner
The Capitol • Tallahassee, FL 32399-0800
www.doacs.state.fl.us

Please Respond to:
Office of Agricultural Water Policy
Rebecca Elliott
P.O. Box 24680
3301 Gun Club Road
West Palm Beach, FL 33416

March 7, 2008

U.S. Army Corps of Engineers, Jacksonville District
Attn: Trent Ferguson
701 San Marco Boulevard
Jacksonville, FL 32207 - 8175

RE: Preliminary Draft - Interim Water Control Plan For Pump Station S-357

Florida Department of Agriculture and Consumer Services' Comments on the Preliminary Draft
for the Interim Water Control Plan For Pump Station S-357

The Florida Department of Agriculture and Consumer Services (FDACS) appreciates the opportunity to comment on the Preliminary Draft for the Interim Water Control Plan For Pump Station S-357 and requests the following concern be addressed in the Final Draft for the Interim Water Control Plan For Pump Station S-357.

The G-3273 constraint on operating S-333 should not be removed until all the permits needed to operate S-356 per the operational protocol proposed in the Combined Structural and Operational Plan (CSOP) are obtained.

Tom MacVicar, the FDACS consultant representing FDACS at the Project Delivery Team (PDT) meetings, provided comments to the United States Army Corp of Engineers (USACE) and the South Florida Water Management District (SFWMD) on the Interim Water Control Plan for Pumping Station S-357 during the PDT meetings.

Page 1 of 2



Florida Agriculture and Forest Products
\$87 Billion for Florida's Economy

Originally the S-356 Pump Station was included in the Draft Interim Water Control Plan for Pump Station S-357. In the interest of getting S-357 through the permitting process, Tom MacVicar recommended the S-356, which we all acknowledge will be more difficult to resolve, be removed as one of the operational components, predicated on retaining the G-3273 constraint. It was FDACS' understanding that the water management needs of the agricultural stakeholders had been identified and would be incorporated into the Interim Water Control Plan for Pumping Station S-357.

The subsequent removal of the S-356 Pump Station along with the removal of the G-3273 constraint in the Preliminary Draft - Interim Water Control Plan For Pump Station S-357 is unexpected and unacceptable. Without operating the S-356 Pump Station, removing the G-3273 constraint means an increase in water diverted to south Dade during wet periods. This is in direct contradiction to all FDACS' comments and input over the 3 years of CSOP and over the past 15 years of debating all the various experimental programs including Test 7, ISOP, ISOP 2000 and IOP.

Retaining the G-3273 constraint is an essential component of the Interim Water Control Plan for Pump Station S-357 if the S-356 Pump Station will not be operated per the CSOP protocols during the interim period. FDACS cannot support the Interim Water Control Plan for Pump Station S-357 proposed in the Preliminary Draft.

We appreciate the opportunity to comment on the Preliminary Draft - Interim Water Control Plan for Pump Station S-357. Our level of concern with the issue we raise here is heightened by the proposed Interim Water Control Plan's lack of consideration for the operational constraint requiring that both the USACE and the SFWMD not reduce the existing levels of flood protection. If you have questions regarding FDACS' comments, please contact Rebecca Elliott at (561) 682-6040.

Sincerely,

Rebecca Elliott
Water Policy Liaison

cc: Ray Scott, FDACS
Tom MacVicar, MFL

Page 2 of 2

LEHTINEN VARGAS & RIEDI

ATTORNEYS AT LAW
A PROFESSIONAL ASSOCIATION

March 3, 2008

Colonel Paul Grosskruger
c/o Trent Ferguson
U.S. Army Corps of Engineers
400 West Bay Street
Jacksonville, District 32232-0019

Via Fax and U.S. Mail and E-Mail MWDWCPComments@evergladesplan.org

**Re: MICCOSUKEE TRIBE OF INDIANS COMMENTS ON THE DRAFT
MODIFIED WATER DELIVERIES INTERIM WATER CONTROL PLAN
FOR PUMP STATION S-357**

Dear Colonel Grosskruger,

The Miccosukee Tribe of Indians hereby files its comments on the U.S. Army Corps of Engineers (Corps) *Draft Modified Water Deliveries Interim Plan for Pump Station S-357* ("Interim Plan"). The Tribe provided comments on the Interim Plan at the public meeting on January 31, 2008, which are incorporated by reference herein. The Tribe is opposed to the Interim Plan because, among other things, the Corps has failed to comply with the National Environmental Policy Act ("NEPA"), the Endangered Species Act ("ESA"), Administrative Procedure Act ("APA"), and its trust responsibility to the Tribe in devising it.

The Tribe objects to the implementation of the Interim Plan, which operates the S-356 pump station, because it will have a significant impact on the human environment that has not been analyzed in an Environmental Impact Statement ("EIS"), as required under NEPA. The attached e-mail by James Riley of the Corps shows that the L29 canal constraint of 7.5 feet, when coupled with the operation of the S-356 pump station would cause higher/stages in durations in WCA 3A. Attachment A. Tribal lands in WCA 3A have suffered a serious decline due to the past ten years of water management operations, including the Interim Operational Plan ("IOP") for the Cape Sable seaside sparrow. The Interim Plan would exacerbate damage to WCA 3A, which is also the designated critical habitat of the endangered Snail Kite. The Corps has not analyzed the impact that these increased stages/durations would have on the Snail Kite and its seriously declining critical

habitat on Tribal Everglades in WCA 3A.

I. THE CORPS MUST COMPLY WITH NEPA

It is unclear to the Tribe exactly which project, or plan, that the Corps intends to operate the S-357 pump (and other Modified Water Delivery Project components) under. The Corps lists a plethora of references including: Mod Waters, CSOP and IOP. It is clear that no matter which plan, or project, that the Corps attempts to operate under, these operations will have significant impacts on the human environment that must be analyzed in an Environmental Impact Statement (EIS) under the NEPA. The Corps is also required to follow the procedures required under the ESA to assess impacts on the endangered species in the area..

The Tribe was disturbed to learn that the Corps intends to rely on a dated 2000 SEIS/GRR on the 8.5 SMA component of the Modified Water Deliveries Project ("Mod Waters"), which is more than 5 years old. This SEIS/GRR does not contain significant new information on the harm that high water has caused to Tribal Everglades in WCA 3A and the Snail Kite. The Tribe contends the Corps is required to conduct an SEIS on this draft Interim Plan and will be forced to seek a remedy in federal Court should the Corps fail to do so. The Tribe reminds the Corps that it has already sought two injunctions against the Corps in federal court for the unauthorized operation of the S-356 pump and will not hesitate to do so once more.

A. Revised Interim Operational Plan ("IOP") Requires an SEIS.

The S-357 pump is not part of the Interim Operation Plan ("IOP") Water Control Plan that was analyzed in the December 2006 SEIS that the Court ordered the Corps to conduct. There are other significant differences between IOP and the Interim Plan that require review in an SEIS. Under IOP, there was a 9 ft. constraint on the L-29 canal, and 7.5 ft. is proposed under the Interim Plan. Also, the capacity of the S-333 was to be increased under IOP, which has not happened here. This will inhibit the ability to get water out of WCA 3A and create significant adverse impacts there.

If the Corps is modifying IOP to include a new structure that will significantly impact the human environment, it must conduct an SEIS on its revised plan.

B. The Segmented Implementation of Mod Waters Requires an SEIS.

The S-356 structure is part of the Modified Water Deliveries Project ("Mod Waters"), which is not yet fully constructed. By prematurely operating segments of Mod Waters in a manner that harms WCA 3A, the Corps is violating the intent of Congress, and by not analyzing the environmental impacts of doing so, the Corps is improperly segmenting the action and violating NEPA.

The goal of Mod Waters was to benefit 600,000 acres of Everglades wetlands by restoring the natural flow of water through the Everglades and into Northeast Shark River Slough. Operation

of the S-356 pump with a 7.5 ft elevation limit, and without the entire project being implemented, will not benefit Tribal Everglades in Water Conservation Area 3 A, which was a Mod Waters project goal. Instead, the Interim Plan will push water against its natural flow direction away from agricultural and urban areas toward the Miccosukee Reserved Area. This will decrease the capacity to remove water from WCA 3A, thus further exacerbating the damage being done to tree islands, the Snail Kite and its critical habitat there.

Finally, it is the Tribe's understanding that people still live east of the levee in the 8.5 SMA, and farther east in the Everglades National Park Expansion Area who could be adversely impacted by these operations. Putting more water into Northeast Shark River Slough will potentially increase flooding in these areas. This flooding potential must be analyzed in an EIS.

C. A Premature or Revised CSOP requires an EIS.

The Corps has not yet conducted an Environmental Impact Statement ("EIS") on the Combined Structural and Operational Plan ("CSOP"). If the Corps is prematurely implementing CSOP with this Interim Plan, the is required to complete an EIS under NEPA.

II. THE CORPS MUST COMPLY WITH THE ESA

Operation of the S-356 pump under the current interim plan will cause higher stages/durations in WCA 3A and harm the endangered Snail Kite and its critical habitat. Research by Dr. Wiley Kitchens shows that the endangered Snail Kite has declined 50% under ISOP and IOP and that it is on the verge of extinction. This is contrary to the Modified Water Deliveries Project, which was required to not adversely impact the Snail Kite and WCA 3A.

Attached is a document entitled *Miccosukee Tribe of Indian Concerns* that contains quotes from Dr. Kitchens Snail Kite Demography Annual Reports, and statements from the Corps SEIS on IOP, that shows the Corps is aware of the damage being done to the Snail Kite critical habitat in WCA 3A. Attachment B. The Corps in its ISOP SEIS acknowledged: "Habitat quality in WCA 3A is changing progressively and dramatically to less desirable habitat, and this conversion is rapid, with changes even after a year." SEIS at 79. The principal concern is that the habitat quality, and thus the carrying capacity, of WCA 3A is already seriously degraded." *Id.* Since 2002, kite production in WCA 3A has dramatically dropped, having produced no kites in 2005." *Id.* at 79. "This coincides with annual shifts (2002-2005) in community types at slough, prairie prime kite foraging sites in WCA 3A." *Id.* The Tribe will also provide the Corps with a copy of Dr. Kitchens', and Dr. Phil Darby's presentations at the Avian Forum that show the adverse impacts that the high water in WCA 3A has caused to the Apple Snail and the Snail Kite.

The draft Interim Plan will exacerbate the damage being caused to the Snail Kite and its critical habitat in WCA 3A caused by closing most of the S-12 gates nine months a years under IOP. Implementation of the Interim Plan in a manner that adversely impacts the Snail Kite, and adversely modifies its critical habitat in WCA 3A, will violate the Endangered Species Act (ESA).

III. THE CORPS HAS NOT ADDRESSED WATER QUALITY CONCERNS

The Corps does not have the Department of Environmental Protection ("DEP") permits required to operate the S-355 A, S-355 B, S-356 and possibly other structures that are part of the draft Interim Plan. A permit has been pending for the S-356 since 2000 but has not been granted. The Corps can not operate without obtaining these permits. Moreover, the Corps must analyze the water quality impacts of the draft Interim Plan in an EIS under NEPA.

IV. THE CORPS MUST COMPLY WITH THE INDIAN TRUST DOCTRINE

The Corps owes the Miccosukee Tribe of Indians a Trust obligation and fiduciary duty to protect Tribal lands, resources, and assets pursuant to the federal Indian Trust Doctrine. This Trust obligation and fiduciary responsibility under the Indian Trust Doctrine extends protection to Tribal lands, resources and assets recognized in the Florida Indian Land Claims Settlement Act, P.L. 97339. This law established a federal Miccosukee Indian Reservation and a perpetual lease in the area of the Everglades adversely impacted by the IOP. The Corps is aware that Tribal lands within WCA-3A are being degraded and destroyed by the Corps' IOP. Despite knowing the devastating impact that these water management actions have had on Tribal lands in WCA 3A, the Corps is considering implementing a draft Interim Plan that will make these conditions even worse.

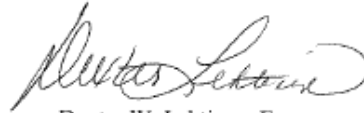
The Corps failed to conduct meaningful consultation on the Interim Plan with the Tribe prior to issuing this Draft. Nor has the Corps conducted modeling to show what the impacts will be on Tribal lands. The Tribe asks the Corps to consider viable alternative operational plans that would alleviate the high water conditions in WCA 3A or the expeditious implementation of the Modified Water Deliveries Project that would be beneficial to all parts of the system.

V. CONCLUSION

The Corps' has failed to comply with NEPA, the ESA, the APA, and the Indian Trust Doctrine in devising the draft Interim Plan. Complying with federal law is necessary to determine the impacts of the Interim Plan on the Miccosukee Tribal Everglades, the endangered Snail Kite, and its critical habitat in WCA 3A. For more than eight years, the Corps' draconian water management actions (including IOP) have caused high water conditions that have devastated Tribal Everglades and harmed the Snail Kite and its critical habitat. The Snail Kite population has declined 50% under these operations. The impact on the Tribe's entire culture and way of life has been incalculable.

The Corps has a Trust responsibility to the Miccosukee Tribe to protect its lands from further destruction. It also has a duty under the ESA to stop the downward spiral of the endangered Snail Kite. The Corps must take immediate steps to conduct an SEIS on the Interim Plan that complies with NEPA and other federal law, and to implement the Modified Water Deliveries Project without delay. Completion of Mod Waters will protect numerous threatened and endangered species, along with urban and agricultural areas. The Corps' failure to complete Mod Waters has resulted in environmentally harmful plans, such as the IOP and now the draft Interim Plan.

Sincerely,

A handwritten signature in cursive script, appearing to read "Dexter Lehtinen".

Dexter W. Lehtinen, Esq.

Bianca V. Pilarte

From: Riley, James M SAJ [James.M.Riley@usace.army.mil]
Sent: Tuesday, January 29, 2008 4:04 PM
To: Ferguson, Trent L SAJ; Swiecichowski, Amy L SAJ Contractor; Taplin, Kimberley A SAJ; Evans, Robert A SAJ; hosung_ahn@nps.gov; Alejandro, Luis A SAJ; kiren_bahm@nps.gov; Bishop, Ryan S SAJ Contractor; bruce_boler@nps.gov; cal@sfwmd.gov; joffre_castro@nps.gov; dan_nehler@fws.gov; christine_chan@nps.gov; Cintron, Barbara B SAJ; cotara@miamidade.gov; friesd@miamidade.gov; david_hallac@nps.gov; inger.hansen@dep.state.fl.us; freddie_james@fws.gov; j3353@aol.com; kelliott@sfstore.org; kevin_kotun@nps.gov; lphillip@sfwmd.gov; plinton@sfwmd.gov; lawrence@sfstore.org; Lizarribar, Jose SAJ; Imccart@sfwmd.gov; levinm@miamidade.gov; martiv@miamidade.gov; mbansee@sfstore.org; bmills@sfwmd.gov; sara_o'connell@nps.gov; kevin_palmer@fws.gov; Peck, Danny D SAJ; Peterson, Debbie R SAJ; Punnett, Richard E SAJ Contractor; gregg_reynolds@nps.gov; terry.l.rice@worldnet.att.net; ingrid_rivera@nps.gov; barry_rosen@fws.gov; ssculley@sfwmd.gov; dave_sikkema@nps.gov; Starnes, Edmund W SAJ; Stormant, Gregory A SAJ; ssylvester@sfwmd.gov; Taylor, Larry E SAJ; tom@mfi.org; tim.towles@myfwc.com; villas@miamidade.gov; joe.walsh@myfwc.com; twoody@sfstore.org; dworth@sfwmd.gov; callie_mcmunigal@fws.gov; Crawford, Daniel E SAJ; Clarke, Ernest SAJ; Sherwood, Devona B SAJ Contractor
Cc: jadornato@npca.org; billb@mfi.org; forpanda@bellsouth.net; edeady@llw-law.com; janice@flashresolutions.com; alipen@msn.com; alovies@comcast.net; eng@ecr.gov; fredfisi@bellsouth.net; mfortin@bellsouth.net; rpbr117@bellsouth.net; gladesfoundation@bellsouth.net; Zediak, John E SAJ; McAdams, James J SAJ; Burns, Marie G SAJ; Foster, Bradley A SAJ
Subject: Clarification of the S356 Pump Station Operational permitting status and history.

Please let me clarify the history and present status of the S356 pump station operational permitting with the FDEP. Some people may have been left with the impression that the Corps had an active application for this pump station into the FDEP and that is not the case.

I initially applied for operations of the S356 Pump station under the original MWD permit, which was issued under a program that no longer exists.

Due to the expiration of that FDEP permitting program (2004), that original application is no longer active. That original S356 operational permit application had an FDEP request for additional information (RAI). The primary unresolved area of information in that RAI had to do with flooding impacts and related matters. That RAI was never answered as some of the questions could not be definitively answered without actual operational data (my understanding).

The Corps has subsequently applied (2006) to FDEP and received FDEP authorization for operating that feature under the new MWD permit in a testing mode only. Prior to the 2006 pump test we had several unsuccessful attempts to test the pump. That test (dry season conditions in Aug 2006) was brief (1 week). This pump test was legally challenged and only two of the pumps were operated due to that challenge.

I think the lesson learned from that legal challenge was that better coordination with all parties needs to take place for the next S356 pump test. The jointly coordinated (FDEP, SFWMD, DOI) COE report on that pump test recommended a series of pump tests to better determine the zone of influence to provide better real world data for an operational plan that produces less anxiety. One of major concerns for this pump station is that it could be operated to pull undesirable water (poor quality relative to the Settlement Agreement or water from an area that could be urbanized in the future) into the ENP. The purpose of this pump is to recycle seepage from the ENP and WCA 3 and not to provide additional flood protection or storm water treatment to the East. A series of pump tests will better define how to operate this pump station in a manner that is less alarming to the concerned parties. At this point in time, my understanding is that we need at least one wet season pump test before applying for a full operational permit. That approach could change very quickly. The L29 canal constraint of 7.5 ft (FDOT roadbase concern), reducing flows from WCA 3A due to higher L29 canal stages (would cause higher stages/duration in WCA 3A) and FWS concerns are the main issues that need to be worked out for the next wet season pump test. Hopefully we can resolve those issues and have a wet season pump test that allows all four pumps to be operated for a reasonable duration in order to gather sufficient data.

When the decision is made to have the next pump test, the Corps will apply to the FDEP for another test authorization under the existing MWD permit. If circumstances/directives change, the Corps could bypass the pump tests and apply

directly for operations (no testing) of this pump station. Based on past experience, in my opinion as an individual (not the Corps position) the best path for success would be to have at least one, fully coordinated (FWS, FWC, Tribe, FDOT, ENP and FDEP, DERM if interested) wet season pump test of sufficient duration to obtain meaningful data. We need at least one (or more) wet season conditions pump test to answer some of the concerns surrounding the operation of this pump station. To apply without even one fully coordinated wet season pump test would likely lead to at least one legal challenge. Success to me for this pump station permit, means FDEP can issue a permit that can successfully withstand a legal challenge...or better yet, not draw legal fire.

Jim Riley, Environmental Engineer
US Army Corps of Engineers
Jacksonville District
Planning Division, Environmental Branch
701 San Marco Blvd, Jacksonville FL 32207

904-232-2438 desk
904-607-9417 work cell

-----Original Message-----

From: Ferguson, Trent L SAJ
Sent: Wednesday, January 16, 2008 9:34 AM
To: Swieczkowski, Amy L SAJ Contractor; Taplin, Kimberley A SAJ; Evans, Robert A SAJ; 'hosung_ahn@nps.gov'; Alejandro, Luis A SAJ; 'kiren_bahm@nps.gov'; Bishop, Ryan S SAJ Contractor; 'bruce_boler@nps.gov'; 'cal@sfwmd.gov'; 'joffre_castro@nps.gov'; 'dan_nehler@fws.gov'; 'christine_chan@nps.gov'; Cintron, Barbara B SAJ; 'cotara@miamidade.gov'; 'friesd@miamidade.gov'; 'david_hallac@nps.gov'; 'inger.hansen@dep.state.fl.us'; 'freddie_james@fws.gov'; 'jl3353@aol.com'; 'kelliott@sfstore.org'; 'kevin_kotun@nps.gov'; 'lphillip@sfwmd.gov'; 'plinton@sfwmd.gov'; 'lawrence@sfstore.org'; Lizarriar, Jose SAJ; 'imccart@sfwmd.gov'; 'levinm@miamidade.gov'; 'martiv@miamidade.gov'; 'mbansee@sfstore.org'; 'bmills@sfwmd.gov'; 'sara_o'connell@nps.gov'; 'kevin_palmer@fws.gov'; Peck, Danny D SAJ; Peterson, Debbie R SAJ; Punnett, Richard E SAJ Contractor; 'gregg_reynolds@nps.gov'; 'terry.i.rice@worldnet.att.net'; Riley, James M SAJ; 'ingrid_rivera@nps.gov'; 'barry_rosen@fws.gov'; 'ssculley@sfwmd.gov'; 'dave_sikkema@nps.gov'; 'Starnes, Edmund W SAJ'; Stormant, Gregory A SAJ; 'ssylvester@sfwmd.gov'; Taylor, Larry E SAJ; 'tom@mfi.org'; 'tim.towles@myfwc.com'; 'villas@miamidade.gov'; 'joe.walsh@myfwc.com'; 'woody@sfstore.org'; 'dworth@sfwmd.gov'; 'callie_mcmunigal@fws.gov'; Crawford, Daniel E SAJ; Clarke, Ernest SAJ; Sherwood, Devona B SAJ Contractor
Cc: 'jadornato@npca.org'; 'billb@mfi.org'; 'forpanda@bellsouth.net'; 'edeady@llw-law.com'; 'janice@flashresolutions.com'; 'alipen@msn.com'; 'alovies@comcast.net'; 'eng@ecr.gov'; 'fredfisi@bellsouth.net'; 'mfortin@bellsouth.net'; 'rpbr1117@bellsouth.net'; 'gladesfoundation@bellsouth.net'
Subject: RE: MWD 8.5 SMA S-357 Water Control Plan VTC with Call-in

Team,

Attached is a copy of the presentation that I will be talking from today.
Also will be using some excel files but to large to email. Presentation is a little rough just put it together this morning but will work for talking purposes.

Trent

MICCOSUKEE TRIBE OF INDIANS' CONCERNS

FWS and CORPS Actions for the CSSS Are: Moving Us Farther Away from Restoration, Devastating Vast Areas of Tribal Everglades in WCA-3A, and Harming Other Endangered Species and Critical Habitat

I. Corps & FWS Have Moved the Everglades Farther Away From Restoration:

A. For almost 10 years now, Corps and FWS actions (IOP, ISOP, deviations, FWS BOs) have closed gates blocking the flow of water south and drowning WCA 3A (i.e. stages in WCA 3A exceeded 10.5 feet in 10 of the past 13 yrs. vs. about 4 times exceeding 10.5 ft. during 40-year period 1953-1993); and exacerbating high water levels in Lake Okeechobee and damaging discharges to the St. Lucie and Caloosahatchee estuaries.

B. WCA 3A (last expanse of sawgrass Everglades left in existence and vital to the Tribe's culture and way of life and biodiversity) is being devastated. Corps' IOP FSEIS admits: "Habitat quality in WCA 3A is changing progressively and dramatically to less desirable habitat" and the "carrying capacity of WCA 3A is already seriously degraded."

C. Snail Kite population has declined an alarming 50% during years of ISOP and IOP (i.e. WCA 3A produced no kites in 2005-no young fledged out); CSSS (A) also declined under actions Corps and FWS allegedly took to "protect" it (more under Test 7 than now after 10 yrs of gate closings); FWS BO predicts 4 more yrs. of IOP will degrade another 184,320 acres of Snail Kite critical habitat per yr. in WCA 3A and even take Sparrows.

II. FWS Proposed Rule a New Threat to Multi-Species Ecosystem Restoration:

FWS Proposed Rule CSSS habitat has an unnatural hydrological management objective that will perpetuate the draconian water management practices taken under ISOP and IOP and will prevent restoration of natural flows under CERP (i.e. Decompartmentalization could not be implemented) and even under CSOP (see nesting condition modeling). By preventing the restoration of natural flows in the western CSSS area, the FWS Proposed Rule will thwart multi-species restoration of the multi-species Everglades ecosystem and will perpetuate the flooding and destruction of Snail Kite critical habitat in WCA 3A that has occurred under the previous CSSS deviations, ISOP, and IOP.

III. Delay, or Stopping, MWD (CSOP) Project = More Everglades Destruction:

A. MWD delay = further habitat destruction and loss of tree islands in WCA 3A; A Corps' EIS estimated 8.4 tree islands and 246 acres lost per each yr. of delay at a cost of \$50,000 to \$500,000 an acre to restore (\$12.3 million to 123 million per year = cost of delay) If the hydrological management objective for the CSSS under IOP or in the FWS rule stops MWD/CSOP from being implemented, the destruction and loss of tree islands in WCA 3A, which are vital to the Tribe's culture and way of life, will continue unabated.

Attachment 2

2006 Corps' FSEIS on IOP: "Snail Kites have increasingly moved their nesting activity to higher elevations in WCA 3A over the past two decades, presumably as the traditional nesting vegetation has been degraded by sustained high water levels due to water management practices." FSEIS 79. Habitat quality in WCA 3A is changing progressively and dramatically to less desirable habitat in this area, and this conversion is rapid, with changes even after a year." Id. "The principal concern is that the habitat quality, and thus the carrying capacity, of WCA 3A is already seriously degraded." Id. "[S]tages in WCA 3A have exceeded 10.5 feet (3.2 m.) in 10 of the past 13 years, while there were only about 4 occurrences of stages exceeding 10.5 ft. (3.2 m.) during the 40-year period from 1953-1993." Id. 76. "The snail kite population in Florida progressively and dramatically decreased between 1999 and 2002." Id. 77. "In 2005, nesting success was lower than during any year between 1992 and 2005. Historically nests in WCA 3A have fledged proportionally the large majority of young in the region. Dr. Kitchens believes that this lowered regional reproduction is a cause of concern regarding the sustainability of the population." Id. 78. "Since 2002, kite production in WCA 3A has dramatically dropped, having produced no kites in 2005." Id. 79 [This coincides with annual shifts (2002-2005) in community types at slough/prairie prime kite foraging sites in WCA 3A.] Id.

2003 Snail Kite Demography Annual Report: "The results suggest...the snail kite population in Florida is going through an alarming declining phase..."[t]he population size of snail kites in Florida appears to have progressively and substantially decreased since 1999. In 1999, the snail kite population was estimated at 3577 individuals, whereas in 2003 this estimate had dropped to 1610 individuals." p.10. "Kitchens and Bennetts (2002) have hypothesized in WCA 3A (which is the most productive breeding site), that the maintenance of prolonged hydroperiod (i.e. longer than under a natural regime) could negatively impact the foraging and breeding habitat used by the kite." p.11. "We would however be supportive of a gradual reduction of water depths and hydroperiods, particularly in the western sector, which is by far the most productive in WCA 3A." p.13.

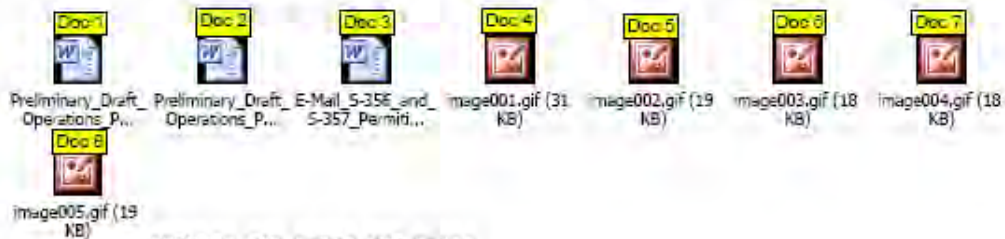
2004 Snail Kite Demography Annual Report: "Recent demographic results show alarming trends concerning the snail kite population in Florida." The current regulation schedule in WCA 3A is shortening the window during which kites can breed." "[O]ur radio telemetry data shows...most kites do not move as freely as previously thought between wetlands which are isolated by extensive areas of unsuitable habitats." "We would also like to reiterate our concern regarding the water regulation of WCA 3A."

2005 Snail Kite Demography Annual Report: "The estimate of population size for 2005 does not indicate any significant recovery." p.3. "Proportionately, the large majority of birds fledged over time have been generated for the Water Conservation Areas, principally WCA 3A, however in 2005 no young were fledged out of WCA 3A." p. 10. This trend of lowered reproduction raises concerns about the population sustainability." Id. "Given the perennial contribution of the WCAs to the annual population of kites, there is little doubt...that the persistence of kites in Florida depends principally on the habitat quality within these wetlands." p.16. "Several researchers...have raised their concerns about potentially adverse effects of flooding in WCA 3A. In recent years water levels in WCA 3A have been maintained at alarmingly high levels." p. 19.

Attachment 2

Ferguson, Trent L SAJ

From: Linton, Paul (plinton@sfwmd.gov)
Sent: Sunday, March 02, 2008 5:30 PM
To: Ferguson, Trent L SAJ; kotun, Kevin; Tom MacVicar; Terry Rice; Freddie_James@fws.gov; Kevin_Palmer@fws.gov; Mierau, Ronald; Hwa, George; Inger Hansen@dep.state.fl.us; Riley, James M SAJ
Cc: Taplin, Kimberley A SAJ; Myers III, Stacy; Sylvester, Susan; Imru, Muluneh; Myers III, Stacy; Knecht, Greg; Smith, Pauline M SAJ; Brown, Timothy R SAJ
Subject: Separate Permits for S-356 and S-357
Importance: High
Attachments: Preliminary_Draft_Operations_Plans_for_S-357.doc;
 Preliminary_Draft_Operations_Plans_for_S-356.doc; E-Mail_S-356_and_S-357_Permiting_Strategy.doc; image001.gif; image002.gif; image003.gif; image004.gif; image005.gif



There appears to be considerable uncertainty and concerns over how the S-356 pump station will be operated both for the interim and long term. Here are my thoughts and recommendations on how to move forward with the interim operations:

Prepare two separate permit applications: one for the operational changes necessary to use S-357 and one for the operational changes necessary to use S-356. Preparing two separate permits allow them to move independently through the permitting process. For example the S-357 permit can be approved relatively quickly (before May in anticipation of the wet season) even if the S-356 permit takes longer.

I have heard several concerns arising from the potential operation of S-356 and have summarized them into the following categories below in the hope of facilitating a better understanding of the issues associated with S-356 operations:

1. S-356 will be used for drainage drawing surface water containing high nutrients.
2. Overuse of S-356 will draw groundwater east resulting in unacceptable water quality.
3. The S-356 is not authorized to pump discharges from S-335 (seepage from WCA-3B and the Pensuocco). This is usually stated as "the S-356 pump station of the MWD ENP project is only authorized to capture seepage from NESS."
4. Use of S-356 with a stage limit less than 9.7 feet NGVD (e.g., 8.0 feet NGVD)

will reduce the discharge capacity available for releases from WCA-3A via S-333 during wet periods resulting in higher water levels in WCA-3A.

The following responses include examples of when the S-356 pump station would be used. Operations of the S-356 pump station would only occur once it is permitted.

Response to the First Concern. All proposed operations of S-356 have the appropriate structures closed to or discharging east to prevent the capture of surface water. Specifically, S-336, S-338, and G-211 are required to be either closed or discharging to the east. To ensure that the water being discharge by S-335 is acceptable S-356 may only be operated when S-337 is closed (or discharging north). Closing S-337 ensures no inflows from S-9 or Lake Okeechobee resulting in S-335 only discharging seepage into the L-30 Canal. Since the seepage into the L-30 Canal comes almost completely from WCA-3B and the Pennsuco wetlands the water quality is very good. Lastly, the consent decree has water quality limits for discharges into NESS. Correspondingly, water quality sampling of the discharges from S-356 will be performed to calculate flow weighted averages.

Response to the Second Concern. While theoretically possible the actual levels in WCA-3B and the Pennsuco Wetland in combination with the open and close levels of S-335 and the on and off levels of S-356 make this unlikely. MODBRANCH Modeling performed as part of the CSOP alternative development indicated that the highest fraction of eastern groundwater captured was less than five percent for the worst year. Furthermore, since this groundwater will be delivered through S-356 pump all of the requirements of the consent decree will apply.

Response to the Third Concern. While the Department of Interior (DOI) may have decided to fund a pump station only sufficient to achieve this goal this does not by itself limit the MWD ENP or CSOP authority. This concern was reviewed in the CSOP process and determined to be unfounded. It should be noted that seepage from WCA-3B into the L-31N Canal occurs along the approximately 1.4 mile long length between S-335 and Tamiami Trail. This water commingles with the seepage occurring from NESS into portion of the L-31N located south of Tamiami Trail making it physically impossible to pump only NESS seepage.

Response to the Fourth Concern. Of these four concerns this one involves the most complex operational details and is the most difficult to resolve. The Tamiami Trail 2005 RGRR and subsequent Record of Decision (ROD) selected (authorized) an alternative with three miles of bridges and road raising sufficient to allow a sustained stage of 9.7 feet NGVD. This stage limit of 9.7 feet NGVD is 2.2 feet higher than the sustained stage limit of 7.5 feet that FDOT has determined for the roads current condition. This stage limit is also about 2.0 feet higher than the maximum sustained stage that the road currently experiences due to S-333 flows. The FDOT has allowed some latitude in the 7.5 feet NGVD limit due to the Cape Sable Seaside Sparrow (CSSS) jeopardy and based on the assumption that the road would be reconstructed to raise it approximately 2 feet resulting in the current road becoming the sub-grade for the raised road. Raising Tamiami Trail to allow a sustained stage of 9.7 feet would allow flow to NESS to continue when the average marsh depths would be over three feet deep. The available head with complete road raising (to push the water into NESS) and marsh depths are expected to provided sufficient flow capacity to allow the simultaneous discharge of both S-333 (at its maximum rate of 1,300 cfs) and S-356 at its maximum capacity under all conditions including during and immediately after large rainfall events.

Unfortunately, due primarily to a lack of funding the USACE is performing a Limited Review Reevaluation (LRR) which includes alternatives with considerably less road raising. If an alternative is selected with road raising which results in a maximum sustained L-29 Canal

stage of less than 8.5 feet NGVD then it is likely that we will be unable to concurrently discharge the 1,300 cfs from S-333 and the maximum S-356 pumping rate of 500 cfs (1,800 cfs) during a large portion of the wet season. This lack of capacity results in the legitimate concern that S-356 flows could diminish the capacity available for S-333 discharges.

Both the USACE and the SFWMD are concerned with sustained high levels in WCA-3A. The USACE and the SFWMD are also concerned about high stages in the L-31N canal. In absence of a higher L-29 Canal Stage limit to allow simultaneous maximum discharges from both S-333 and S-356 the operations will need to respond to the prevailing conditions and anticipated future conditions. The following illustrative scenarios describe how operations would respond differently to Dry, Average, and Wet conditions.

Dry Conditions. During established dry conditions the regulation schedule for WCA-3A will have already substantively lowered WCA-3A. The goal during established dry conditions will be to minimize structural flow to tide as appropriate based on the water levels and rainfall forecasts. Specifically, S-335 releases (seepage from WCA-3B into the L-30 canal) could be captured along with seepage from WCA-3B and NESS (which flow directly into the L-31N canal) by the S-356 pump station and delivered to NESS via the L-29 Canal. In the short term (these permits) no changes are proposed for the rainfall formula therefore all of the rainfall formula volumes will be delivered from WCA-3A via S-333. In the long term (CSOP permit) we will have to address new source of flow for the rainfall formula such as 1) flow from WCA-3B via S-356A and S-356B (most likely included), 2) S-335 discharges conveyed to NESS via the S-356 pump and L-29 Canal (hopefully yes), and 3) seepage from WCA-3B and NESS into the L-31N canal (if a reasonable estimates of these seepage quantities can be made so that the seepage from NESS can be counted as recycled rather than new water). Depending on the conditions some of the S-335 flows may be routed south to maintain the hydraulic ridge along the rocky glades (low flow rate operation of S-332B and S-332C) and supply flow to Taylor Slough (S-332D).

Average Conditions. Since, average conditions are rarely sustained (transitioning into either wet or dry conditions) the goal during somewhat average conditions is to maintain or move towards average conditions. For example if WCA-3A is above average conditions then operations to the extent allowed by the IOP for Protection of the CSSS would be adjusted to move towards average conditions. This includes routing S-335 water to tide via S-338 and routing WCA-3A water to the Rocky Glades (via S-332B and S-332C), Taylor Slough (via S-332D) and Southern Glades (via S-176, S-177, and S-18C).

Wet Conditions. If WCA-3A is in a detrimentally high condition then all allowable and practical efforts to lower WCA-3A would be used including but not limited to the following: 1) discharge of all or part of S-335 flows to tide via S-338 to increase the available discharge capacity to NESS (via S-333), 2) use of the S-332B, S-332C, and S-332D structures to route water from WCA-3A to the Rocky Glades and Taylor Slough (e.g. IOP Column 2), and 3) use of S-176, S-177, and S-18C to route water from WCA-3A to the Southern Glades. If the L-31N canal stage exceeds 5.8 feet NGVD and there is insufficient S-338 or G-211 capacity to lower this reach (S-335 to G-211) then S-356 would be used, if available, to pump up to 250 cfs from the L-31N Canal to the L-29 Canal. The 250 cfs limit would only be exceeded if the L-31N Canal stage exceeds 6.3 feet NGVD. If WCA-3A stages are not detrimentally high then the full capacity of S-356 may be used to moderate L-31N stages, capture S-335 flows, and reduce G-211 discharges if needed.

Both the S-356 and S-357 operation plans will include a substantive modification to the S-3273 constraint which currently terminates flow into NESS when the stage at this location exceeds 6.8 feet NGVD. The proposed changes include 1) raising the stage limit, 2) changing the location of the measuring point, and 2) including trigger levels for the L-31N Canal. Specifically, when the L-31N Canal stage as measured by the S-336 HW (or by

G-211 HW or S-338 HW or S-335 TW if S-336 HW stage is not available) is below 5.8 feet NGVD no actions will be taken to moderate levels in NESS. If the stage in L-31N as measured by the S-336 HW exceeds 5.8 feet NGVD and the stage at S-3576 exceeds 7.5 feet for more than 24 hours then flow into the L-29 Canal will be reduced as necessary to assist in lowering the L-31N stage. All allowable discharges routes (e.g. S-338, and G-211 but not S-336) will be used to the extent available to lower the L-31N before flow to NESS is reduced. This is where S-356 can actually help as it, if available, can be used to maintain the L-31N stage below 5.8 feet NGVD thereby potentially preventing complete termination of inflow to NESS.

Figure 1 shows the location of the available stage monitoring gages in NESS. My initial analysis used the average of G-3576 and G-3578 to represent the average stage in NESS along the L-31N Canal. Figure 2 and 3 show how the average of G-3576 and G-3578 are essentially equal to the G-3273 stage for stages above 7 feet NGVD. However, given the higher northern transmissivity, the similarity of these gages at high stages (Figure 4), and the simplicity of using only one trigger gage I am recommending that we use G-3576 instead of the average of G-3576 and G-3578.

Future Thoughts

Submit a future permit application or applications which allow a longer use of S-12C or eliminates the closure completely in combination with some or all of the following:

- * Semi-Permanent closing of the Tram Road Culverts.
- * Installation of a 12 to 18 inch high gravel weir in the L-29 Gaps in combination with the installation of another more western gap (with a lower gravel weir) or widening of the existing gaps. These low level weirs would still allow flow during high water periods but would terminate flow earlier thereby reducing flow along this western route in the dry season.
- * Removal of Old Tamiami Trail to increase the wet season discharge capacity. The resulting fill would be used to construct partial plugs (e.g. top 3 feet below ground surface) in the L-67A canal. Would start with the section of Old Tamiami from S-12D to the L-67 extension as this would result in the addition flow occurring as far east as practical and more importantly because S-12D is not subject to a sparrow closure.

* Modification (or clarification) to the rainfall and regulation schedule for the distribution of flow along Tamiami Trail. When the combined discharge from regulation schedule and the rainfall formula are below 1,400 cfs increase the portion of flow to NESS from 55% to 70%. For this threshold value of 1,400 cfs the 55% target equates to 770 cfs where as the 70% target equates to 980 cfs. Assuming that the Tamiami Trail modification will allow a sustained L-29 Canal Stage sufficient to maintain 1,250 cfs of discharge into NESS the 980 cfs would leave 250 cfs of capacity available for S-356 to return seepage from WCA-3B (including L-30 seepage released from S-335) and NESS. This modification would include providing a minimum flow to S-12A of up to 50 cfs to maintain a minimum Tail Water stage of X.X feet NGVD.

I hope this helps. Please call me if you have any questions.

Paul

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PRELIMINARY DRAFT SECTION 7.05 OF AN OPERATION PLAN FOR S-357**7-05.1. Interim Operating Plan for Phase 1**

Prior to the completion of the C-111 NDA, the 8.5 SMA pump station and general area will be operated as follows:

7-05.1.1 S-357 and 8.5 SMA STA

Pump Station S-357 will operate during high water levels. The pump station operations will be primarily based on water levels in a stilling well located in the new seepage canal approximately 3,500 feet west of L-31N (about a 1,000 feet from the seepage canal northern terminus). The telemetry system's current limitations do not allow for use of this remote location for completely automatic operations. The primary location will be used by the operator to adjust operations from the control room. The on site automatic system (DDSP) will use the headwater (south side) level of the pump station for the on site triggering of operations should condition change rapidly or if the primary trigger location stage information is not available. Two different criteria's will be set for this pump station based on time of year:

7-05.1.1.1 Wet Season

The S-357 pump station will turn on when the stilling well water level reaches elevation 5.2 feet. The pump will turn off when the stilling well water level is lower than elevation 4.9 feet. The pump station will pump as required to maintain this upstream canal stage and prevent surface water discharge from the STA. The pumping discharge rate will be reduced or shutdown completely to prevent an overflow event during Phase 1 operations.

7-05.1.1.2 Dry Season

The S-357 pump station will turn on when the stilling well water level reaches elevation 5.7 feet. The pump will turn off when the stilling well water level is lower than elevation 5.4 feet. The pump station will pump as required to maintain this upstream canal stage and prevent surface water discharge from the STA. The pumping discharge rate will be reduced or shutdown completely to prevent an overflow event during Phase 1 operations.

7-05.1.2 S-331

The S-331 Pump station has three diesel driven pumps capable of pumping a total of 1,160 cfs (387 cfs each). S-331 has three general operational rules:

7-05.1.2.1 8.5 SMA Seepage Canal Criteria

This criteria replaces the Angels Well criteria. The stage measured at Angel's well, located west the 8.5 SMA protection levee, will no longer be used to determine the appropriate operating criteria for S-331. Discharges through S-331 can be made if the S-331 Tailwater (TW) stage is below elevation 6.0 feet and the S-176 Headwater (HW) stage is below 5.5 feet. If either of these water levels, downstream of S-331, are exceeded, discharges at S-331 will be terminated until the S-176 HW stage recedes to elevation 5.0 feet and the S-331 TW is at or below elevation 6.0 feet. If heavy rainfall is forecasted S-331 discharges will be terminated when the S-176 HW stage is between elevations 5.0 feet and 5.5 feet. The following text describes the operations of S-331 as triggered by the stage measured by the stilling well located in the 8.5 SMA Seepage Canal (same well used for S-357 operations):

(a) If the stage at the 8.5 SMA Seepage Canal well is at or below an elevation of 5.5 feet there will be complete flexibility in operating the L-31N borrow canal system within the design limits specified by the Corps. This includes the ability to convey water from S-334 (excess water from WCA-3A or WCA-3B), S-335 with S-337 closed (excess water from the L-30 canal), excess water from the L-31N between S-335 and G-211 (S-336 closed or discharging east), or a combination of these sources. This water can be used for low pumping rate (125 cfs or less per pump stations) operations of S-332B, S-332C, and S-332D. Low pumping rate operations can be initiated below the flood control operation levels. If necessary water can also be conveyed to the southern glades via S-176, S-177, and S-18C.

(b) If the stage at the 8.5 SMA Seepage Canal well is between elevations 5.5 and 6.0 feet the average daily water level upstream of S-331 will be maintained between elevations 4.5 feet and 5.0 feet if permitted by downstream conditions.

(c) If the stage at the 8.5 SMA Seepage Canal well is at or above an elevation of 6.0 feet the average daily water level upstream of S-331 will be maintained between elevations 4.5 feet and 5.0 feet until the water level at the 8.5 SMA Seepage Canal well recedes below 5.7 feet if permitted by downstream conditions.

7-05.1.2.2 Flood Control for Area Along East Side of L-31N

When the headwater stage at S-331 is higher than elevation 5.3 feet use one pump (387 cfs) or S-173 with or without siphons to maintain stage. Once stage recedes below elevation 5.1 feet cease discharges. Increase pumping to two pumps when headwater is greater than elevation 6.0 feet. Once stage recedes below

elevation 5.5 feet turn off second pump. Increase pumping to three pumps when headwater is greater than elevation 6.5 feet. Once stage recedes below 6.0 feet turn off third pump. These operations only apply when the 8.5 SMA Seepage Canal is at or below 5.5 feet as lower canal stages are required when the 8.5 SMA Seepage Canal exceeds 5.5 feet.

7-05.1.2.3 Water Supply

Water supply operations are unchanged from the Interim Operation Plan (IOP) for Protection of the Cape Sable Seaside Sparrow (CSSS). Releases may be made when; the headwater of S-176 is lower than elevation 4.0 feet the headwater of S-177 is lower than elevation 3.0 feet or the headwater of S-18C is lower than elevation 2.0 feet.

7-05.1.3 Flow to NESS (L-29 and L-31N Constraint)

With the completion of the 8.5 SMA flood mitigation project the criteria limiting flow into NESS will be modified to allow additional flow to NESS to the extent feasible with the system current features. The following operational criteria will be used:

- The L-29 Canal stage limit approved by the FDOT will limit how much water can be discharged into the L-29 Canal. A specific number is not provided herein as FDOT needs to provide this number and because Tamiami Trail is expected to be raised in the near future.
- The G-3273 Stage limit of 6.8 feet NGVD will be replaced with a criteria which use the G-3576 stage and the stage in the L-31N canal to determine whether operation actions to reduce inflows to NESS via the L-29 Canal are required.

L-29 Canal Stage Limit. The L-29 Borrow Canal as measured at the S-355B TW will be used as the first controlling criteria for discharging flows into NESRS; this location was chosen to prevent localized fluctuations due to discharges at the S-333 and S-356 (authorized in a separate permit) from affecting the trigger stage. In the absence of a timely or dependable signal from S-335B TW then either the S-333 TW or S-334 HW may be used. Based on concerns from the Florida Department of Transportation (FDOT) for the integrity of Tamiami Trail between S-333 and S-334, the stage constraint of 9.0 feet from the IOP for Protection of the CSSS will be lowered to elevation provided by the FDOT. The FDOT has already approved a sustained water level of 7.5 feet NGVD. Specifically, the FDOT considers that the current Design High Water for Tamiami Trail between S-333 and S-334 to be elevation 7.5 feet.

Coordination with the FDOT will occur before the implementation of canal stages above elevation 7.5 feet. Review of historical data does indicate, however, that stages above elevation 7.5 feet occasionally

occurred due to direct rainfall and seepage from the area to the north (WCA-3B), independent of current operational schedules. It is expected that this stage limit will likely increase to at least 8.0 feet NGVD as a result of road raising implemented as part of the Tamiami Trail Modifications component of the Modified Water Deliveries to Everglades National Park (MWD ENP). The L-29 Canal Stage limit can be raised once the road is raised and FDOT provides written concurrence.

L-31N Stage Trigger. When the L-31N Canal stage as measured by S-336 HW (or by G-211 HW or S-338 HW or S-335 TW if S-336 HW stage is not available) is below 5.8 feet no actions are taken to moderate levels in NESS. If the stage in L-31N as measured by the S-336 HW exceeds 5.8 feet and the stage in NESS as measured by G-3576 exceeds 7.5 feet then flow into the L-29 Canal will be terminated completely until the stage in NESS is below 7.5 feet or the stage in the L-31N canal is below 5.8 feet NGVD. All available routes for discharge of L-31N flow will be used to the extent feasible with their downstream conditions before reduction in L-29 Canal inflows are implemented.

If the L-29 Canal stage exceeds the stage limit then inflow will be reduced based on the prevailing conditions in WCA-3A and WCA-3B. Given that this permit does not authorize any new structures to convey water from WCA-3A to WCA-3B the reduction order would typically be:

Without S-356

- First reduce S-355A and S-335B inflows as appropriate based on the water level in WCA-3B, the time of year, and forecast for adverse weather conditions (e.g. large rain fall, tropical storms, or hurricanes).
- Second reduce S-333 discharge as need to maintain the L-29 stage at or below the L-29 Canal stage limit if a high water conditions does not exist in the L-31N canal. If the L-31N stage exceeds 5.8 feet (high water condition in L-31N) and the stage at G-3576 exceeds 7.5 feet then complete closure of S-333 is required until G-3576's stage falls below 7.5 feet.

With S-356 (authorized by a separate permit)

- First reduce S-355A and S-335B inflows as appropriate based on the water level in WCA-3B, the time of year, and forecast for adverse weather conditions (e.g. large rain fall, tropical storms, or hurricanes).
- Second reduce S-333 discharge and S-356 as appropriate based on the water level in WCA-3A and L-31N, the time of year, and forecast for adverse weather conditions. For example, reduce S-333 flows down to approximately 1,000 cfs while concurrently

reducing S-356 discharge to 250 cfs if a high water conditions does not exist in the L-31N canal.

- Third further reduce S-355A, S-355B, S-333, and S-356 as appropriate based on water levels, the time of year, and forecast for adverse weather conditions. For example reduce S-355A and S-355B flows to zero, S-333 flows to approximately 500 cfs and S-356 discharges to 125 cfs if a high water conditions does not exist in the L-31N canal.
- Reduce S-333 as necessary to meet the L-29 Canal stage limit.
- Reduce S-356 as necessary to meet the L-29 Canal stage limit.

It is important to note that this permit does not include S-356 pump station operations. The S-356 pump station is included in this section to provide perspective on how S-356 operation may be included in the future through a separate permit. Until S-356 operations are authorized by a separate permit operation of this pump station will be limited to exercising the pumps monthly.

7-05.1.4 S-356 Operation Not Authorized by this Permit

This permit does not include the S-356 pump station. A description of the S-356 pump station operational criteria is included in this section to provide perspective on how S-356 operations will integrate with the operation authorized by this permit. Until S-356 operations are authorized by a separate permit operation of this pump station will be limited to exercising the pumps monthly.

When conditions permit (G-3576 and L-29 constraints), discharges from S-356 will go into L-29 Canal. Pumping will be limited to the sum of the following:

- The amount of seepage into L-31N in the reach between S-335 and G-211.
- The volume released from S-335 minus the portion of the S-335 release (if any) which is discharged through S-338, S-336, and G-211.
- The change in canal storage volume and direct rainfall onto the canal.

A technical team will develop a simple equation to estimate seepage from WCA-3B and NESS into the L-31N canal. This equation will be developed taking in consideration the fact that S-356 has four 125 cfs pumps (flow rates can be 0, 125, 250, 375, and 500 cfs) and the desire to establish rates or guidance on a weekly basis. Below the mandatory On level this seepage equation will be used to determine S-356 pumping rates. Stages in the L-31N canal above 5.8 feet will trigger S-356 pumping if the L-29 canal stage is below the mandatory Off level. The S-356 pump station can only be used when the appropriate structures are closed or discharge water from not into the L-31N canal to ensure

that S-356 is not used to pump surface water from the C-1 or C-4 Canal and does not receive direct surface water from the S-9 pump station. Operation of the S-356 to capture water from the L-31N canal requires that:

- S-335 is closed or it is discharging with S-337 closed to isolate the L-30 canal.
- S-336 is closed or discharging to the east (HW > TW + 0.1 feet)
- S-338 is closed or discharging to the east (HW > TW + 0.1 feet)
- G-211 is closed or discharging to the east (HW > TW + 0.1 feet)

7-05.1.5 S-335

The S-335 structure will release water when the stage measured at the S-335 Headwater (north side) exceeds 6.0 feet and the S-335 Tail Water (south side) is below 6.0 feet. This water can be subsequently routed through any of the following routes or combinations thereof.

- To tide through S-338.
- To NESS through S-356 (when authorized through a separate permit)
- To Rocky Glades via G-211, S-173/S-333, S-332B and S-332C
- To Taylor Slough via G-211, and S-332D
- To the Sothern Glades via G-211, S-173/S-333, S-176, S-177, and S-18C.

PRELIMINARY DRAFT SECTION 7.05 OF AN OPERATION PLAN FOR S-357**7-05.1. Interim Operating Plan for Phase 1**

Prior to the completion of the C-111 NDA, the 8.5 SMA pump station and general area will be operated as follows:

7-05.1.1 S-357 and 8.5 SMA STA (Authorized in the S-357 Permit)

Pump Station S-357 will operate during high water levels. The pump station operations will be primarily based on water levels in a stilling well located in the new seepage canal approximately 3,500 feet west of L-31N (about a 1,000 feet from the seepage canal northern terminus). The telemetry system's current limitations do not allow for use of this remote location for completely automatic operations. The primary location will be used by the operator to adjust operations from the control room. The on site automatic system (DDSP) will use the headwater (south side) level of the pump station for the on site triggering of operations should condition change rapidly or if the primary trigger location stage information is not available. Two different criteria's will be set for this pump station based on time of year:

7-05.1.1.1 Wet Season

The S-357 pump station will turn on when the stilling well water level reaches elevation 5.2 feet. The pump will turn off when the stilling well water level is lower than elevation 4.9 feet. The pump station will pump as required to maintain this upstream canal stage and prevent surface water discharge from the STA. The pumping discharge rate will be reduced or shutdown completely to prevent an overflow event during Phase 1 operations.

7-05.1.1.2 Dry Season

The S-357 pump station will turn on when the stilling well water level reaches elevation 5.7 feet. The pump will turn off when the stilling well water level is lower than elevation 5.4 feet. The pump station will pump as required to maintain this upstream canal stage and prevent surface water discharge from the STA. The pumping discharge rate will be reduced or shutdown completely to prevent an overflow event during Phase 1 operations.

7-05.1.2 S-331 (Authorized in the S-357 Permit)

The S-331 Pump station has three diesel driven pumps capable of pumping a total of 1,160 cfs (387 cfs each). S-331 has three general operational rules:

7-05.1.2.1 8.5 SMA Seepage Canal Criteria

This criteria replaces the Angels Well criteria. The stage measured at Angel's well, located west the 8.5 SMA protection levee, will no longer be used to determine the appropriate operating criteria for S-331. Discharges through S-331 can be made if the S-331 Tailwater (TW) stage is below elevation 6.0 feet and the S-176 Headwater (HW) stage is below 5.5 feet. If either of these water levels, downstream of S-331, are exceeded, discharges at S-331 will be terminated until the S-176 HW stage recedes to elevation 5.0 feet and the S-331 TW is at or below elevation 6.0 feet. If heavy rainfall is forecasted S-331 discharges will be terminated when the S-176 HW stage is between elevations 5.0 feet and 5.5 feet. The following text describes the operations of S-331 as triggered by the stage measured by the stilling well located in the 8.5 SMA Seepage Canal (same well used for S-357 operations):

(a) If the stage at the 8.5 SMA Seepage Canal well is at or below an elevation of 5.5 feet there will be complete flexibility in operating the L-31N borrow canal system within the design limits specified by the Corps. This includes the ability to convey water from S-334 (excess water from WCA-3A or WCA-3B), S-335 with S-337 closed (excess water from the L-30 canal), excess water from the L-31N between S-335 and G-211 (S-336 closed or discharging east), or a combination of these sources. This water can be used for low pumping rate (125 cfs or less per pump stations) operations of S-332B, S-332C, and S-332D. Low pumping rate operations can be initiated below the flood control operation levels. If necessary water can also be conveyed to the southern glades via S-176, S-177, and S-18C.

(b) If the stage at the 8.5 SMA Seepage Canal well is between elevations 5.5 and 6.0 feet the average daily water level upstream of S-331 will be maintained between elevations 4.5 feet and 5.0 feet if permitted by downstream conditions.

(c) If the stage at the 8.5 SMA Seepage Canal well is at or above an elevation of 6.0 feet the average daily water level upstream of S-331 will be maintained between elevations 4.5 feet and 5.0 feet until the water level at the 8.5 SMA Seepage Canal well recedes below 5.7 feet if permitted by downstream conditions.

7-05.1.2.2 Flood Control for Area Along East Side of L-31N

When the headwater stage at S-331 is higher than elevation 5.3 feet use one pump (387 cfs) or S-173 with or without siphons to maintain stage. Once stage recedes below elevation 5.1 feet cease discharges. Increase pumping to two pumps when headwater is greater than elevation 6.0 feet. Once stage recedes below

elevation 5.5 feet turn off second pump. Increase pumping to three pumps when headwater is greater than elevation 6.5 feet. Once stage recedes below 6.0 feet turn off third pump. These operations only apply when the 8.5 SMA Seepage Canal is at or below 5.5 feet as lower canal stages are required when the 8.5 SMA Seepage Canal exceeds 5.5 feet.

7-05.1.2.3 Water Supply

Water supply operations are unchanged from the Interim Operation Plan (IOP) for Protection of the Cape Sable Seaside Sparrow (CSSS). Releases may be made when; the headwater of S-176 is lower than elevation 4.0 feet the headwater of S-177 is lower than elevation 3.0 feet or the headwater of S-18C is lower than elevation 2.0 feet.

7-05.1.3 L-29 and L-31N Constraint (Authorized in the S-357 Permit)

This section was authorized by the S-357 permit however a section was added to describe how the S-356 operations are integrated into the procedure for reducing flow to NESS. With the completion of the 8.5 SMA flood mitigation project the criteria limiting flow into NESS will be modified to allow additional flow to NESS to the extent feasible with the system current features. The following operational criteria will be used:

- The L-29 Canal stage limit approved by the FDOT will limit how much water can be discharged into the L-29 Canal. A specific number is not provided herein as FDOT needs to provide this number and because Tamiami Trail is expected to be raised in the near future.
- The G-3273 Stage limit of 6.8 feet NGVD will be replaced with a criteria which use the G-3576 stage and the stage in the L-31N canal to determine whether operation actions to reduce inflows to NESS via the L-29 Canal are required.

L-29 Canal Stage Limit. The L-29 Borrow Canal as measured at the S-355B TW will be used as the first controlling criteria for discharging flows into NESRS; this location was chosen to prevent localized fluctuations due to discharges at the S-333 and S-356 (authorized in a separate permit) from affecting the trigger stage. In the absence of a timely or dependable signal from S-335B TW then either the S-333 TW or S-334 HW may be used. Based on concerns from the Florida Department of Transportation (FDOT) for the integrity of Tamiami Trail between S-333 and S-334, the stage constraint of 9.0 feet from the IOP for Protection of the CSSS will be lowered to elevation provided by the FDOT. The FDOT has already approved a sustained water level of 7.5 feet NGVD. Specifically, the FDOT considers that the current Design High Water for Tamiami Trail between S-333 and S-334 to be elevation 7.5 feet.

Coordination with the FDOT will occur before the implementation of canal stages above elevation 7.5 feet. Review of historical data does indicate, however, that stages above elevation 7.5 feet occasionally occurred due to direct rainfall and seepage from the area to the north (WCA-3B), independent of current operational schedules. It is expected that this stage limit will likely increase to at least 8.0 feet NGVD as a result of road raising implemented as part of the Tamiami Trail Modifications component of the Modified Water Deliveries to Everglades National Park (MWD ENP). The L-29 Canal Stage limit can be raised once the road is raised and FDOT provides written concurrence.

L-31N Stage Trigger. When the L-31N Canal stage as measured by S-336 HW (or by G-211 HW or S-338 HW or S-335 TW if S-336 HW stage is not available) is below 5.8 feet no actions are taken to moderate levels in NESS. If the stage in L-31N as measured by the S-336 HW exceeds 5.8 feet and the stage in NESS as measured by G-3576 exceeds 7.5 feet then flow into the L-29 Canal will be terminated completely until the stage in NESS is below 7.5 feet or the stage in the L-31N canal is below 5.8 feet NGVD. All available routes for discharge of L-31N flow will be used to the extent feasible with their downstream conditions before reduction in L-29 Canal inflows are implemented.

If the L-29 Canal stage exceeds the stage limit then inflow will be reduced based on the prevailing conditions in WCA-3A and WCA-3B. Given that this permit does not authorize any new structures to convey water from WCA-3A to WCA-3B the reduction order would typically be:

Without S-356

- First reduce S-355A and S-335B inflows as appropriate based on the water level in WCA-3B, the time of year, and forecast for adverse weather conditions (e.g. large rain fall, tropical storms, or hurricanes).
- Second reduce S-333 discharge as need to maintain the L-29 stage at or below the L-29 Canal stage limit if a high water conditions does not exist in the L-31N canal. If the L-31N stage exceeds 5.8 feet (high water condition in L-31N) and the stage at G-3576 exceeds 7.5 feet then complete closure of S-333 is required until G-3576's stage falls below 7.5 feet.

With S-356

- First reduce S-355A and S-335B inflows as appropriate based on the water level in WCA-3B, the time of year, and forecast for adverse weather conditions (e.g. large rain fall, tropical storms, or hurricanes).
- Second reduce S-333 discharge and S-356 as appropriate based on the water level in WCA-3A and L-31N, the time of year, and

forecast for adverse weather conditions. For example, reduce S-333 flows down to approximately 1,000 cfs while concurrently reducing S-356 discharge to 250 cfs if a high water conditions does not exist in the L-31N canal.

- Third further reduce S-355A, S-355B, S-333, and S-356 as appropriate based on water levels, the time of year, and forecast for adverse weather conditions. For example reduce S-355A and S-355B flows to zero, S-333 flows to approximately 500 cfs and S-356 discharges to 125 cfs if a high water conditions does not exist in the L-31N canal.
- Reduce S-333 as necessary to meet the L-29 Canal stage limit.
- Reduce S-356 as necessary to meet the L-29 Canal stage limit.

7-05.1.4 S-356 Operations (Authorized by this Permit)

When conditions permit (G-3576 and L-29 constraints), discharges from S-356 will go into L-29 Canal. Pumping will be limited to the sum of the following:

- The amount of seepage into L-31N in the reach between S-335 and G-211.
- The volume released from S-335 minus the portion of the S-335 release (if any) which is discharged through S-338, S-336, and G-211.
- The change in canal storage volume and direct rainfall onto the canal.

A technical team will develop a simple equation to estimate seepage from WCA-3B and NESS into the L-31N canal. This equation will be developed taking in consideration the fact that S-356 has four 125 cfs pumps (flow rates can be 0, 125, 250, 375, and 500 cfs) and the desire to establish rates or guidance on a weekly basis. Below the mandatory On level this seepage equation will be used to determine S-356 pumping rates. This rate would be pumped if the system conditions allow (e.g. WCA-3A level and the L-29 canal level).

Stages in the L-31N canal above 5.8 feet will trigger S-356 pumping if the L-29 canal stage is below the mandatory Off level. The S-356 pump station can only be used when the appropriate structures are closed or discharge water from not into the L-31N canal to ensure that S-356 is not used to pump surface water from the C-1 or C-4 Canal and does not receive direct surface water from the S-9 pump station. Operation of the S-356 to capture water from the L-31N canal requires that:

- S-335 is closed or it is discharging with S-337 closed to isolate the L-30 canal.
- S-336 is closed or discharging to the east ($HW > TW + 0.1$ feet)

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- S-338 is closed or discharging to the east (HW > TW + 0.1 feet)
- G-211 is closed or discharging to the east (HW > TW + 0.1 feet)

7-05.1.5 S-335 (Authorized in the S-357 Permit)

The S-335 structure will release water when the stage measured at the S-335 Headwater (north side) exceeds 6.0 feet and the S-335 Tail Water (south side) is below 6.0 feet. This water can be subsequently routed through any of the following routes or combinations thereof.

- To tide through S-338.
- To NESS through S-356 (when authorized through a separate permit)
- To Rocky Glades via G-211, S-173/S-333, S-332B and S-332C
- To Taylor Slough via G-211, and S-332D
- To the Sothern Glades via G-211, S-173/S-333, S-176, S-177, and S-18C.

PERMITS FOR S-356 AND S-357

There appears to be considerable uncertainty and concerns over how the S-356 pump station will be operated both for the interim and long term. Here are my thoughts and recommendations on how to move forward with the interim operations:

Prepare two separate permit applications: one for the operational changes necessary to use S-357 and one for the operational changes necessary to use S-356. Preparing two separate permits allow them to move independently through the permitting process. For example the S-357 permit can be approved relatively quickly (before May in anticipation of the wet season) even if the S-356 permit takes longer.

I have heard several concerns arising from the potential operation of S-356 and have summarized them into the following categories below in the hope of facilitating a better understanding of the issues associated with S-356 operations:

1. S-356 will be used for drainage drawing surface water containing high nutrients.
2. Overuse of S-356 will draw groundwater east resulting in unacceptable water quality.
3. The S-356 is not authorized to pump discharges from S-335 (seepage from WCA-3B and the Pensuccho). This is usually stated as "the S-356 pump station of the MWD ENP project is only authorized to capture seepage from NESS."
4. Use of S-356 with a stage limit less than 9.7 feet NGVD (e.g. 8.0 feet NGVD) will reduce the discharge capacity available for releases from WCA-3A via S-333 during wet periods resulting in higher water levels in WCA-3A.

The following responses include examples of when the S-356 pump station would be used. Operations of the S-356 pump station would only occur once it is permitted.

Response to the First Concern. All proposed operations of S-356 have the appropriate structures closed to or discharging east to prevent the capture of surface water. Specifically, S-336, S-338, and G-211 are required to be either closed or discharging to the east. To ensure that the water being discharge by S-335 is acceptable S-356 may only be operated when S-337 is closed (or discharging north). Closing S-337 ensures no inflows from S-9 or Lake Okeechobee resulting in S-335 only discharging seepage into the L-30 Canal. Since the

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seepage into the L-30 Canal comes almost completely from WCA-3B and the Pennsuco wetlands the water quality is very good. Lastly, the consent decree has water quality limits for discharges into NESS. Correspondingly, water quality sampling of the discharges from S-356 will be performed to calculate flow weighted averages.

Response to the Second Concern. While theoretically possible the actual levels in WCA-3B and the Pennsuco Wetland in combination with the open and close levels of S-335 and the on and off levels of S-356 make this unlikely. MODBRANCH Modeling performed as part of the CSOP alternative development indicated that the highest fraction of eastern groundwater captured was less than five percent for the worst year. Furthermore, since this groundwater will be delivered through S-356 pump all of the requirements of the consent decree will apply.

Response to the Third Concern. While the Department of Interior (DOI) may have decided to fund a pump station only sufficient to achieve this goal this does not by itself limit the MWD ENP or CSOP authority. This concern was reviewed in the CSOP process and determined to be unfounded. It should be noted that seepage from WCA-3B into the L-31N Canal occurs along the approximately 1.4 mile long length between S-335 and Tamiami Trail. This water commingles with the seepage occurring from NESS into portion of the L-31N located south of Tamiami Trail making it physically impossible to pump only NESS seepage.

Response to the Fourth Concern. Of these four concerns this one involves the most complex operational details and is the most difficult to resolve. The Tamiami Trail 2005 RGRR and subsequent Record of Decision (ROD) selected (authorized) an alternative with three miles of bridges and road raising sufficient to allow a sustained stage of 9.7 feet NGVD. This stage limit of 9.7 feet NGVD is 2.2 feet higher than the sustained stage limit of 7.5 feet that FDOT has determined for the roads current condition. This stage limit is also about 2.0 feet higher than the maximum sustained stage that the road currently experiences due to S-333 flows. The FDOT has allowed some latitude in the 7.5 feet NGVD limit due to the Cape Sable Seaside Sparrow (CSSS) jeopardy and based on the assumption that the road would be reconstructed to raise it approximately 2 feet resulting in the current road becoming the sub-grade for the raised road. Raising Tamiami Trail to allow a sustained stage of 9.7 feet would allow flow to NESS

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to continue when the average marsh depths would be over three feet deep. The available head with complete road raising (to push the water into NESS) and marsh depths are expected to provided sufficient flow capacity to allow the simultaneous discharge of both S-333 (at its maximum rate of 1,300 cfs) and S-356 at its maximum capacity under all conditions including during and immediately after large rainfall events.

Unfortunately, due primarily to a lack of funding the USACE is performing a Limited Review Reevaluation (LRR) which includes alternatives with considerably less road raising. If an alternative is selected with road raising which results in a maximum sustained L-29 Canal stage of less than 8.5 feet NGVD then it is likely that we will be unable to concurrently discharge the 1,300 cfs from S-333 and the maximum S-356 pumping rate of 500 cfs (1,800 cfs) during a large portion of the wet season. This lack of capacity results in the legitimate concern that S-356 flows could diminish the capacity available for S-333 discharges.

Both the USACE and the SFWMD are concerned with sustained high levels in WCA-3A. The USACE and the SFWMD are also concerned about high stages in the L-31N canal. In absence of a higher L-29 Canal Stage limit to allow simultaneous maximum discharges from both S-333 and S-356 the operations will need to respond to the prevailing conditions and anticipated future conditions. The following illustrative scenarios describe how operations would respond differently to Dry, Average, and Wet conditions.

Dry Conditions. During established dry conditions the regulation schedule for WCA-3A will have already substantively lowered WCA-3A. The goal during establish dry conditions will be to minimize structural flow to tide as appropriate based on the water levels and rainfall forecasts. Specifically, S-335 releases (seepage from WCA-3B into the L-30 canal) could be captured along with seepage from WCA-3B and NESS (which flow directly into the L-31N canal) by the S-356 pump station and delivered to NESS via the L-29 Canal. In the short term (these permits) no changes are proposed for the rainfall formula therefore all of the rainfall formula volumes will be delivered from WCA-3A via S-333. In the long term (CSOP permit) we will have to address new source of flow for the rainfall formula such as 1) flow from WCA-3B via S-355A and S-355B (most likely included), 2) S-335 discharges conveyed to NESS via the S-356 pump and L-29

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Canal (hopefully yes), and 3) seepage from WCA-3B and NESS into the L-31N canal (if a reasonable estimates of these seepage quantities can be made so that the seepage from NESS can be counted as recycled rather than new water). Depending on the conditions some of the S-335 flows may be routed south to maintain the hydraulic ridge along the rocky glades (low flow rate operation of S-332B and S-332C) and supply flow to Taylor Slough (S-332D).

Average Conditions. Since, average conditions are rarely sustained (transitioning into either wet or dry conditions) the goal during somewhat average conditions is to maintain or move towards average conditions. For example if WCA-3A is above average conditions then operations to the extent allowed by the IOP for Protection of the CSSS would be adjusted to move towards average conditions. This includes routing S-335 water to tide via S-338 and routing WCA-3A water to the Rocky Glades (via S-332B and S-332C), Taylor Slough (via S-332D) and Southern Glades (via S-176, S-177, and S-18C).

Wet Conditions. If WCA-3A is in a detrimentally high condition then all allowable and practical efforts to lower WCA-3A would be used including but not limited to the following: 1) discharge of all or part of S-335 flows to tide via S-338 to increase the available discharge capacity to NESS (via S-333), 2) use of the S-332B, S-332C, and S-332D structures to route water from WCA-3A to the Rocky Glades and Taylor Slough (e.g. IOP Column 2), and 3) use of S-176, S-177, and S-18C to route water from WCA-3A to the Southern Glades. If the L-31N canal stage exceeds 5.8 feet NGVD and there is insufficient S-338 or G-211 capacity to lower this reach (S-335 to G-211) then S-356 would be used, if available, to pump up to 250 cfs from the L-31N Canal to the L-29 Canal. The 250 cfs limit would only be exceeded if the L-31N Canal stage exceeds 6.3 feet NGVD. If WCA-3A stages are not detrimentally high then the full capacity of S-356 may be used to moderate L-31N stages, capture S-335 flows, and reduce G-211 discharges if needed.

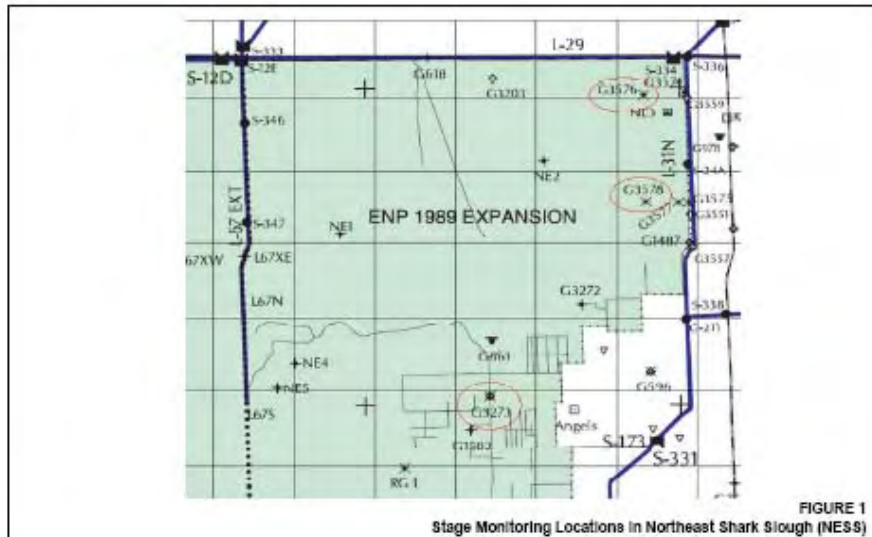
Both the S-356 and S-357 operation plans will include a substantive modification to the S-3273 constraint which currently terminates flow into NESS when the stage at this location exceeds 6.8 feet NGVD. The proposed changes include 1) raising the stage limit, 2) changing the location of the measuring point, and 2) including trigger levels for the L-31N

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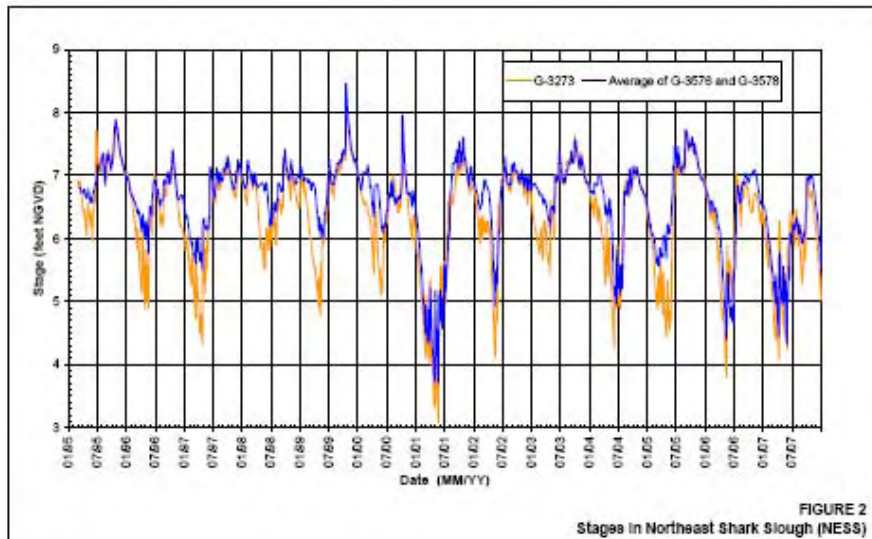
Canal. Specifically, when the L-31N Canal stage as measured by the S-336 HW (or by G-211 HW or S-338 HW or S-335 TW if S-336 HW stage is not available) is below 5.8 feet NGVD no actions will be taken to moderate levels in NESS. If the stage in L-31N as measured by the S-336 HW exceeds 5.8 feet NGVD and the stage at S-3576 exceeds 7.5 feet for more than 24 hours then flow into the L-29 Canal will be reduced as necessary to assist in lowering the L-31N stage. All allowable discharges routes (e.g. S-338, and G-211 but not S-336) will be used to the extent available to lower the L-31N before flow to NESS is reduced. This is where S-356 can actually help as it, if available, can be used to maintain the L-31N stage below 5.8 feet NGVD thereby potentially preventing complete termination of inflow to NESS.

Figure 1 shows the location of the available stage monitoring gages in NESS. My initial analysis used the average of G-3576 and G-3578 to represent the average stage in NESS along the L-31N Canal. Figure 2 and 3 show how the average of G-3576 and G-3578 are essentially equal to the G-3273 stage for stages above 7 feet NGVD. However, given the higher northern transmissivity, the similarity of these gages at high stages (Figures 4 and 5), and the simplicity of using only one trigger gage I am recommending that we use G-3576 instead of the average of G-3576 and G-3578.

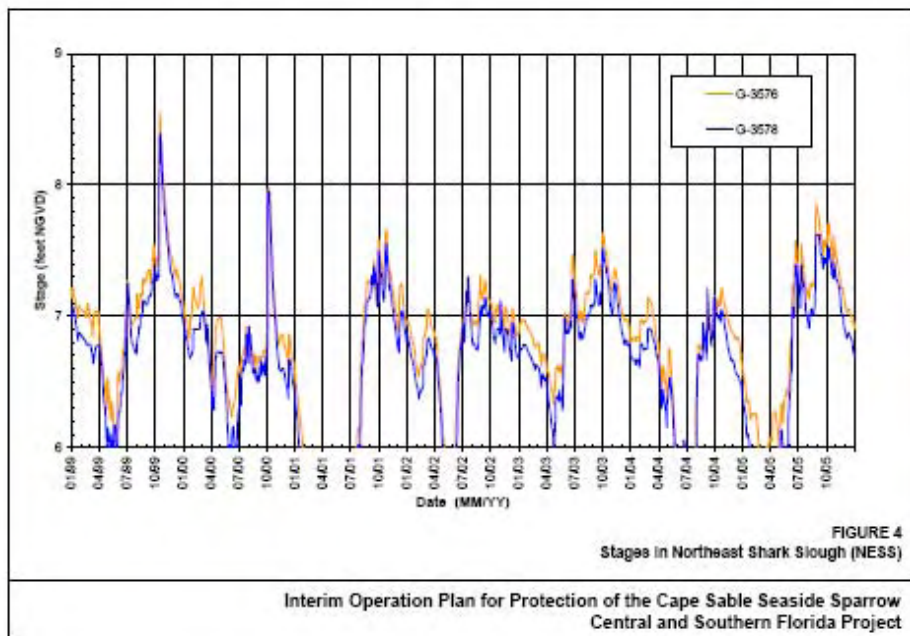
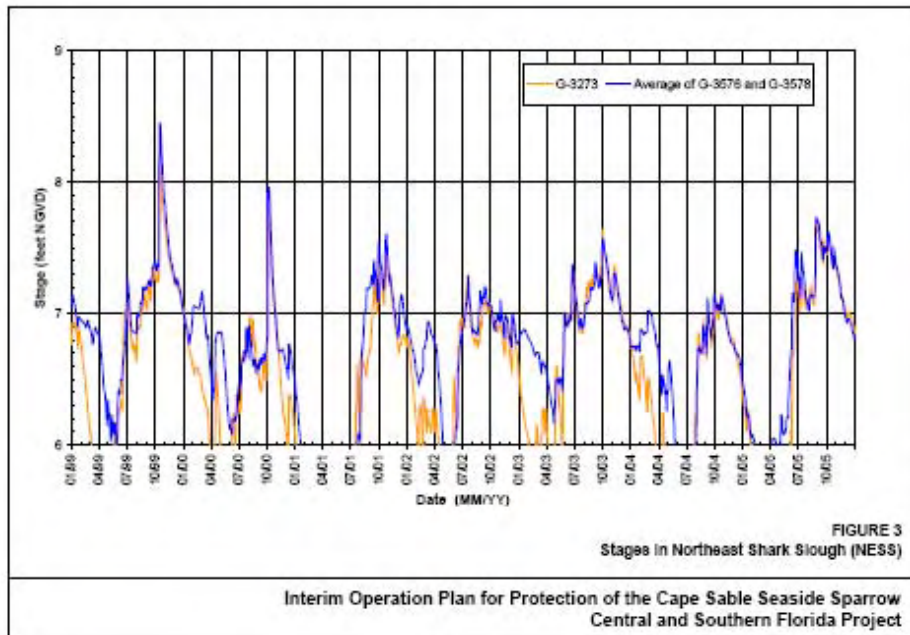
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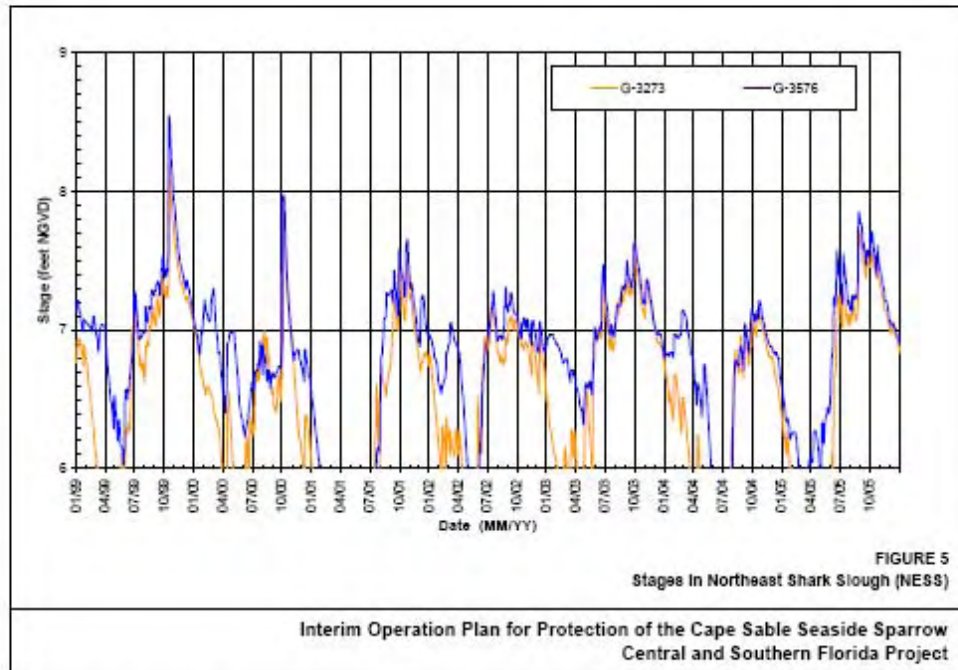


Interim Operation Plan for Protection of the Cape Sable Seaside Sparrow
Central and Southern Florida Project



Interim Operation Plan for Protection of the Cape Sable Seaside Sparrow
Central and Southern Florida Project





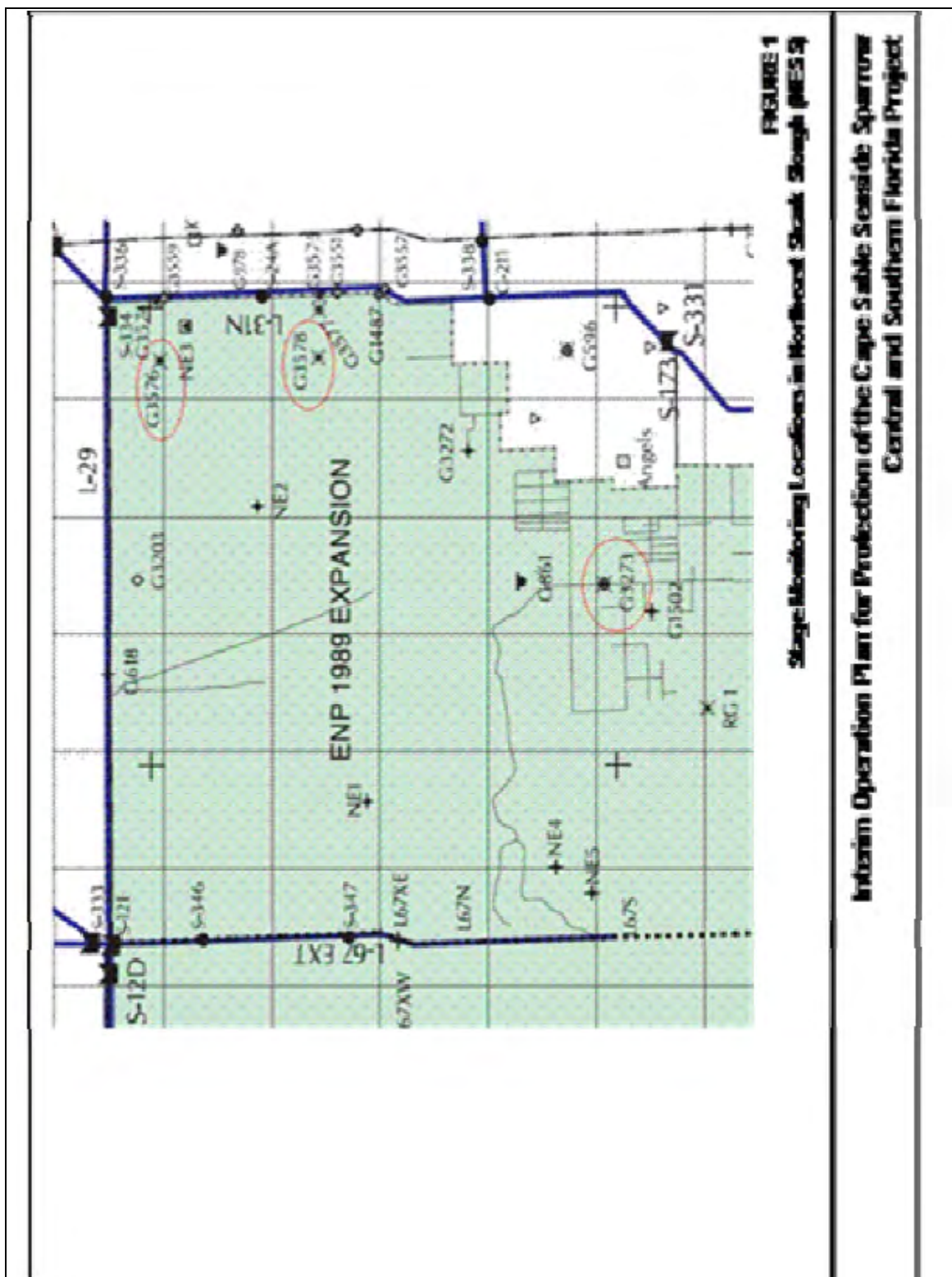
FUTURE THOUGHTS

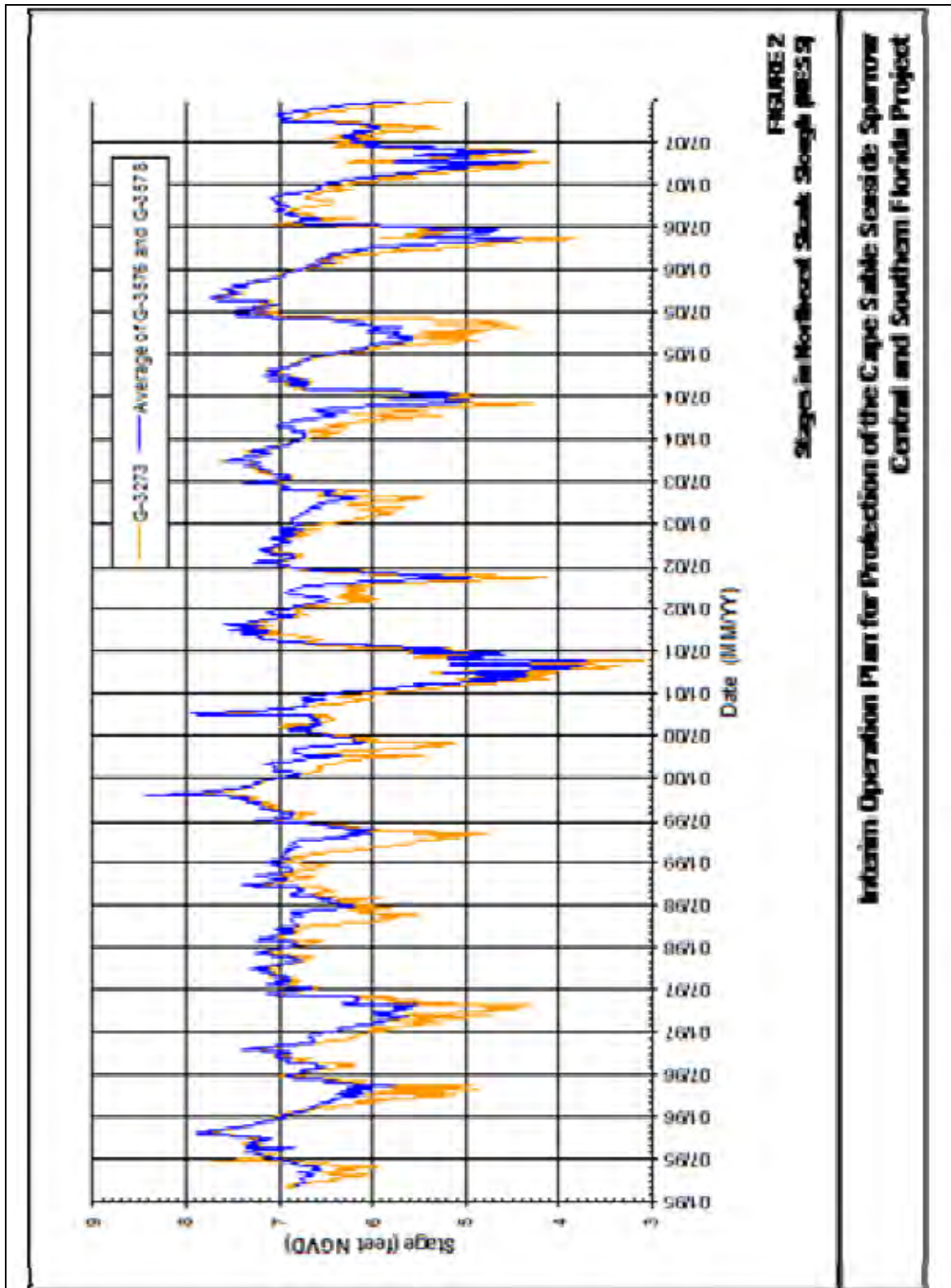
Submit a future permit application or applications which allow a longer use of S-12C or eliminates the closure completely in combination with some or all of the following:

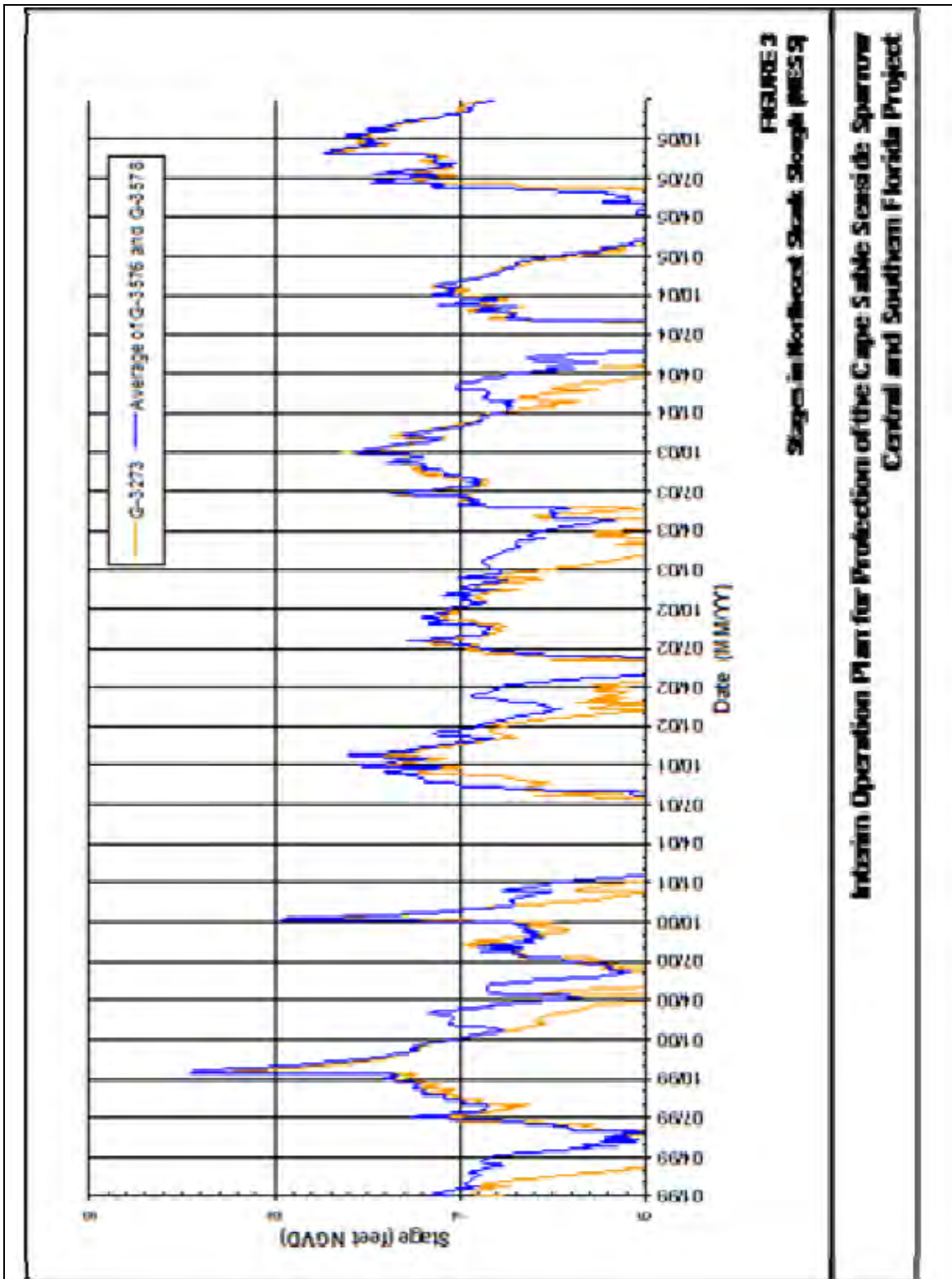
- Semi-Permanent closing of the Tram Road Culverts.
- Installation of a 12 to 18 inch high gravel weir in the L-29 Gaps in combination with the installation of another more western gap (with a lower gravel weir) or widening of the existing gaps. These low level weirs would still allow flow during high water periods but would terminate flow earlier thereby reducing flow along this western route in the dry season.
- Removal of Old Tamiami Trail to increase the wet season discharge capacity. The resulting fill would be used to construct partial plugs (e.g. top 3 feet below ground surface) in the L-67A canal. Would start with the section of Old Tamiami from S-12D to the L-67 extension as this would result in the addition flow occurring as far east as practical and more importantly because S-12D is not subject to a sparrow closure.

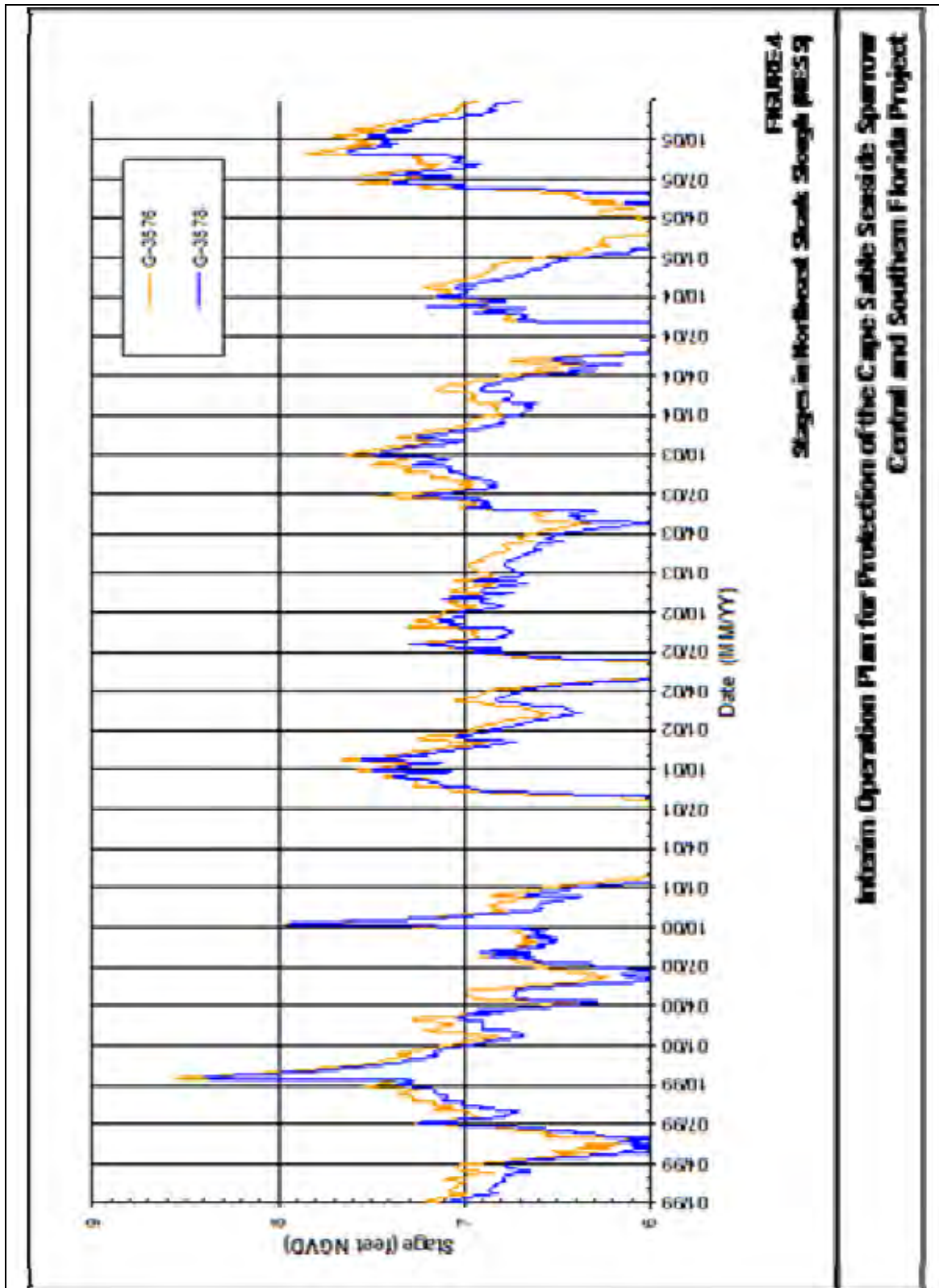
- Modification (or clarification) to the rainfall and regulation schedule for the distribution of flow along Tamiami Trail. When the combined discharge from regulation schedule and the rainfall formula are below 1,400 cfs increase the portion of flow to NESS from 55% to 70%. For this threshold value of 1,400 cfs the 55% target equates to 770 cfs where as the 70% target equates to 980 cfs. Assuming that the Tamiami Trail modification will allow a sustained L-29 Canal Stage sufficient to maintain 1,250 cfs of discharge into NESS the 980 cfs would leave 250 cfs of capacity available for S-356 to return seepage from WCA-3B (including L-30 seepage released from S-335) and NESS. This modification would include providing a minimum flow to S-12A of up to 50 cfs to maintain a minimum Tail Water stage of X.X feet NGVD.

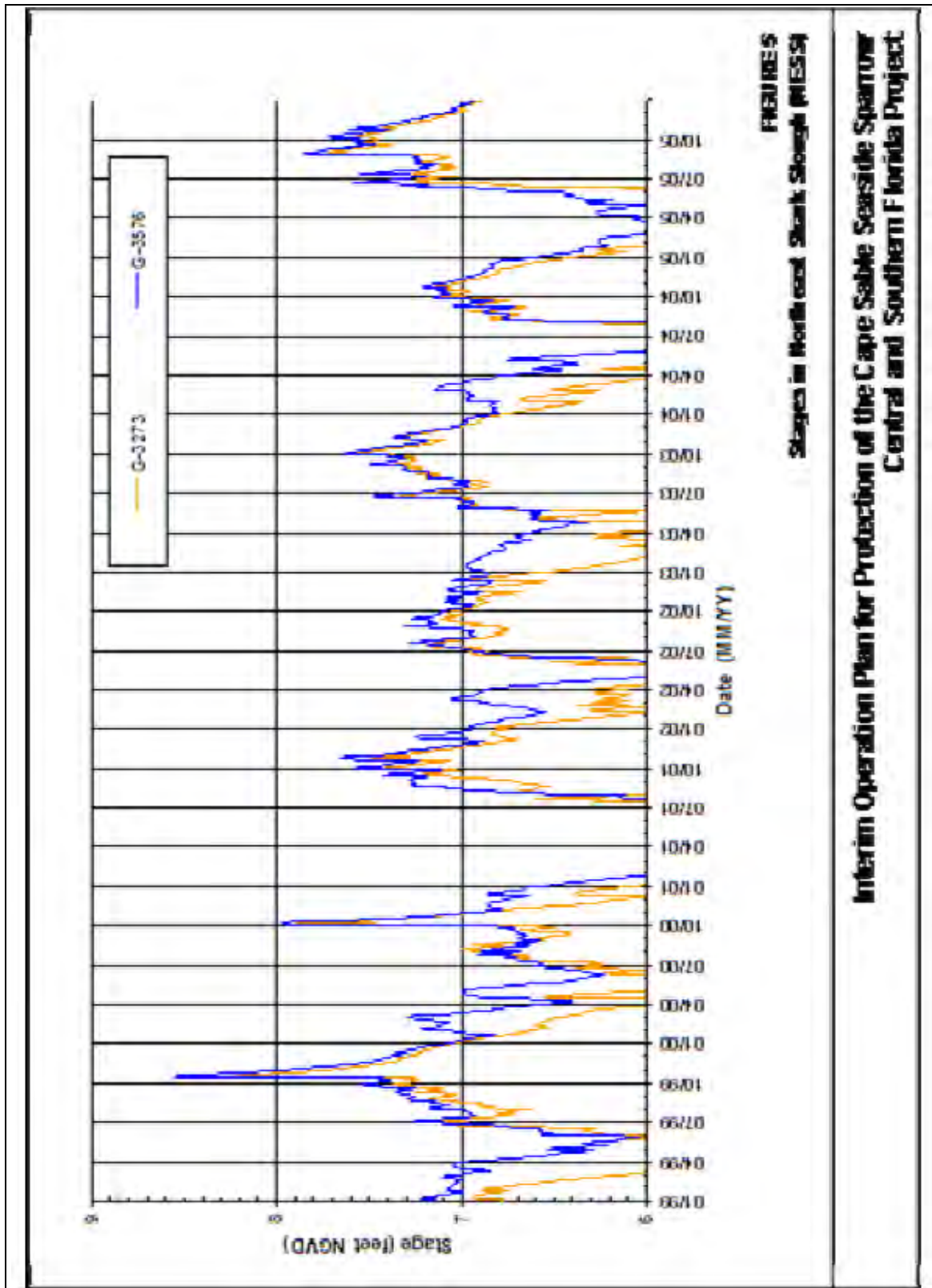
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**United States Department of the Interior**

FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960



September 19, 2008

RECEIVED

29 Sept 2008

Rebecca Griffith, Ph.D.
Chief, Planning Division
U.S. Army Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

Attention: Susan Conner

Service Federal Activity Code: 41420-2008-FA-0613
Service Consultation Code: 41420-2008-I-0764
Date Received: September 4, 2008
Project: S-357 Pump Station
Interim Water Control Plan

Dear Dr. Griffith:

The U.S. Fish and Wildlife Service (Service) has reviewed your letter dated September 3, 2008, requesting consultation on the S-357 Pump Station Interim Water Control Plan. We are providing the following list of threatened and endangered species and critical habitat located within and adjacent to the project area, in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*), to aid you in completion of the proposed draft Environmental Assessment (EA).

The S-357 pump station is located, per the General Reevaluation Report and Supplemental Environmental Impact Statement, Alternative 6D, at the southern terminus of the 8.5 Square-Mile Area (8.5 SMA) seepage collection canal in western Miami-Dade County, Florida approximately 3 miles west of Krome Avenue (State Road 997). The Stormwater Treatment Area (STA) is located 2,000 feet (ft) south of 168th Street and is approximately one-half mile southwest of the pump station. The pump station and STA are connected by an above ground flow-way which is approximately 320-ft wide.

The Service requests that the U.S. Army Corps of Engineers consider the following threatened and endangered species that may occur within and adjacent to the project area including: the West Indian manatee (*Trichechus manatus*), wood stork (*Mycteria americana*), Florida panther (*Puma concolor coryi*), Everglade snail kite (*Rostrhamus sociabilis plumbeus*), Cape Sable seaside sparrow (*Ammodramus maritimus*), and eastern indigo snake (*Drymarchon corais*).

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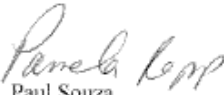
Rebecca Griffith, Ph.D.

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couperi). The bald eagle (*Haliaeetus leucocephalus*) has been delisted under the Act but continues to be protected under the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act. There is no critical habitat for the species listed above within the proposed project area.

We look forward to reviewing the draft EA. If you have any questions regarding this letter or while drafting the EA, please contact me or project biologist, Kevin Palmer at 772-562-3909, extension 280. Thank you for your continued efforts to protect and restore federally listed species and critical habitats in south Florida.

Sincerely yours,


for Paul Souza
Field Supervisor
South Florida Ecological Services Office

cc:
District, West Palm Beach, Florida (Paul Linton)
NPS, Homestead, Florida (Alicia Logalbo)
Miami-Dade DERM, Miami, Florida (Susan Markley)
FWC, Vero Beach, Florida (Tim Towles)
Service, Jacksonville, Florida (Miles Meyer)
DEP, West Palm Beach, Florida (Inger Hansen)



United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

March 3, 2008

Colonel Paul Grosskruger
Commander
United States Army Corps of Engineers
Jacksonville District
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Colonel Grosskruger:

Thank you for the opportunity to review and provide comments on the *Draft Interim Water Control Plan For Pumping Station S-357* (draft plan). The construction and operation of the Modified Water Deliveries to Everglades National Park Project (MWD) and the environmental modifications to the C-111 Canal Project are important steps in moving toward more natural water depths and hydroperiods in Everglades National Park (ENP). The Department of the Interior (Department) appreciates the efforts of your staff in producing the draft plan and looks forward to working with you as we seek to improve it.

The S-357 pump is part of an operational plan to provide a flood protection system for the 8.5 square mile area as described in the report entitled "*Central and South Florida Project Modified Water Deliveries to Everglades National Park, Florida, 8.5 Square Mile Area, General Reevaluation Report and Final Supplemental Environmental Impact Statement*" and dated July 2000 (GRR and FSEIS). The GRR/FSEIS specifically describes the 8.5 SMA component as a project to provide flood mitigation for the residential areas in the East Everglades that were going to be adversely affected by the increased water stages and durations due to the MWD Project. The GRR/FSEIS includes two primary goals:

- Provide restoration of natural hydrologic conditions in ENP relative to timing, location, and volume of surface and ground water, and
- Mitigate the impacts to the residents of the 8.5 SMA from higher water stages resulting from the MWD Project.

The proposed water control plan should affirmatively emphasize that the purpose of the operations of S-357 is to provide mitigation for flooding impacts within the 8.5 SMA resulting from implementation of the MWD Project, not to provide flood protection over and above this mitigation in ways that are detrimental to ENP. The draft plan states that operation of S-357 *should* not adversely impact the restoration levels of the ENP hydrology (emphasis added). The Department believes that the operation of S-357 *must* not adversely impact the hydrology in ENP.

As these proposed operations to mitigate for MWD impacts are being provided to the 8.5 SMA prior to increased inflows to Northeast Shark Slough (NESS), the Department recommends the draft plan take an adaptive approach by slightly adjusting the pumping triggers and implementing an appropriate monitoring plan so that adjustments can be considered, as necessary. We recommend raising the trigger level that would initiate pumping from 5.2 feet to 5.4 feet, but still allow the pumps to continue to pump down to 4.9 feet. Without increased flows into NESS creating higher stages in the marsh, these changes would still provide a substantially lower risk of flooding while still allowing the pumps to begin pumping at a slightly higher water level than is proposed. Additionally, while we transition from the initial to subsequent operations as new features of the MWD project are implemented, the monitoring plan will ensure that the real-world operations continue to provide mitigation required by statute. This approach will ensure that the appropriate balance between providing the environmental benefits in the park and the required mitigation for increased water levels in the 8.5 SMA is maintained.

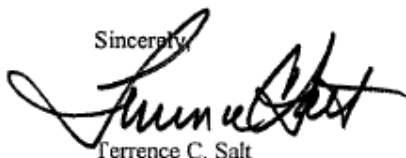
It is also important to the Department that the S-356 pumps be operated consistent with restoration goals. The specific Initial Operating Plan (IOP) operations referenced in this water control plan for S-356 should be included in the draft plan, as well as the intent of these operations. Since S-356 is not currently operational, the draft plan should also discuss the potential S-357 operations if S-356 is not operational.

The operations at S-331 that are described in this draft plan should also include the operational intent language for that structure. For example, the triggers for S-331 operations are associated with water levels in the seepage canal and are necessary at this time because the C-111 detention areas are not fully completed. However, when these detention areas are completed, the Department understands that S-331 flood control operations will be based on the S-331 head water levels developed for the proposed Combined Structural and Operations Plan (CSOP) and would no longer be triggered by water level in the seepage canal. This intent should be clearly expressed in this water control plan.

Finally, the United States Fish and Wildlife Service (Service) is currently collecting scientific data regarding optimum hydrologic conditions for snail kites and apple snails in Water Conservation Area 3A. The Service would like to explore with the Corps and our other partners the best ways to use the proposed operations and the operational flexibility inherent in the Central and Southern Florida Project to move us towards achieving these optimum hydrologic conditions in this area of critical concern.

Additional detailed and technical comments from the Service and the National Park Service are attached.

Sincerely,



Terrence C. Salt
Director of Everglades Restoration Initiatives



United States
Department of



February 19, 2008

TO: Mr. Dan Kimball
Superintendent, Everglades National Park

FROM: Dr. Carol Mitchell
Deputy Director, SFNRC

RE: SFNRC Comments on the Proposed S357 Water Control Plan

Background

The USACE is in the process of determining how to operate the portions of the Modified Water Deliveries project that have already been constructed. Constructed features include the S355 structures and the S356 and S357 pump stations. The most significant of these features at this time is the S357 pump station, as without Tamiami Trail modifications, the other two features are not able to discharge significant quantities of water.

Currently the 8.5SMA receives substantial flood protection from the use of S331 which is currently operated based on the water level near Chekika. The name of the gage is Angel's Well. When the water level at this gage reaches 5.5 feet NGVD, S331 begins to discharge into South Dade. Angel's Well is very far from the S331 pump and as a result, S331 pumps a very large quantity of water as it attempts to drain Angel's well, and in turn the entire 8.5SMA, below 5.5 feet. This practice drains a significant amount of water from NESS into the South Dade Conveyance system.

Inflows into NESS are limited by two factors, one, the L29 canal stage and two, the water level in NESS measured at G3273. When the water level at G3273 rises to land surface, inflows into NESS are stopped. Typically, when this event occurs it remains above land surface until the end of the wet season, effectively stopping NESS inflows until the next dry season.

Changes due to the Proposed Plan

The water control plan under review proposes to relocate the "Angels" criteria to a gage located in the seepage collection canal that feeds S357. When the water level at this gage exceeds 5.5 feet, S331 will pump to clear water from the eight-and-a-half. S357 will use the same gage to control operations and will be set to turn on before the S331 at 5.2 feet. S357 will continue to pump until the gage hits 4.9 feet. Currently, the S357 will only be discharging into a small STA and therefore will have to stop pumping when it is full. In the next year or so, the STA should be connected to the rest of the South Dade Detention area, further decreasing S331 discharges relative to this plan. In addition to these operations the proposed plan, as currently written, removes the G3273 restriction on NESS inflows.

Expected Results

Attachment 1 – page 1 of 2

In the absence of modeling results, SFNRC hydrologic staff used best professional judgment to evaluate potential effects of the proposed plan on Everglades National Park hydrologic resources. Staff expects to see some modest hydrologic benefits of the proposed plan. The relocation of the Angel's Well criteria to a gage location that tends to have lower water levels is expected to significantly reduce the pumpage at S331, and thus reduce the amount of water removed from NESS. The S357 discharges will serve to provide a seepage buffer to the groundwater flows leaving the Park in the immediate vicinity of the pump; this potential benefit is very local as most of the S357 discharges will end up in the lower reach of the L31N canal. Finally, the removal of the G3273 constraint on NESS inflows should allow for modest, but virtually continuous discharges into NESS when WCA3A is above schedule. It should be noted, however, that hydrologic benefits of these operations cannot be fully realized until the Tamiami Trail and the Conveyance and Seepage components of the MWD project are completed (at the earliest 2012) and the C-111 features are fully constructed and operational (2009-2010).

Central Issues and Comments

1) A central issue with the proposed S357 Water Control Plan is that the Plan will provide the full level of flood control benefits to the 8.5 SMA prior to increased inflows to Northeast Shark Slough. The federal government position up to this time has been that the 8.5 SMA water control features were authorized to mitigate the impacts of the increased inflows to NESS under the MWD project, not to provide flood protection to the area (USFWS & NPS Final CAR, 2000;USACE 8.5SMA ROD, December 2000).

2) If the current proposal is adopted, Everglades National Park desires a level of assurance that when NESS water levels are actually increased, the operational plan will not be adjusted by further lowering of stage triggers that control water management in the 8.5 SMA.

3) Once the C111 detention areas are fully built out, operational changes should be made to take full advantage of the connection of the 8.5 SMA system to these features. At that time, the S357 STA will be able to discharge into this system. Therefore, S331 should no longer be triggered by the gage in the seepage canal, and S331 would respond only to its headwater trigger. Everglades National Park desires a level of assurance on this future condition as well.

It is difficult to evaluate the issue of flood mitigation v. flood protection quantitatively, since there has been no modeling on the proposed operational plan, and no NEPA review is proposed to evaluate its impacts. Particular concern should be highlighted concerning the lack of quantitative technical evaluations in the context of this modification to the Interim Operational Plan, since the IOP was presented with a lawsuit over technical issues early in its implementation.

USACE – Jacksonville District
Central & Southern Florida Project

Draft Interim Water Control Plan for Pumping Station S-357
Modified Water Deliveries to Everglades National Park
8.5 Square Mile Area

February 7, 2008

General

- 1) Apply the acronym for the C-111 North Detention Area or NDA consistently throughout the document.

Specific

Pg. ii, Table of Contents – Suggest altering the order of the figures to: 1) General Location Map, 2) Zoom in on the 8.5 Square Mile Area, and 3) General Map of North East Shark River Slough with Gages.

Pg. 1, Section 7-01, 1st Paragraph – Suggest incorporating the reference to Fig. 1 in this introductory paragraph.

Pg. 1, Section 7-01, 1st Paragraph – Suggest providing an estimate for when the NDA and CSOP features will be authorized and fully operational.

Pg. 2, Section 7-02, 1st Paragraph – Suggest incorporating the reference to Fig. 2 in this introductory paragraph.

Pg. 3, Section 7-03.2, 1st Paragraph – Suggest rounding “6.09 feet” to 6.1 feet.

Pg. 4, Section 7-04 1st Paragraph 1st Sentence – Consider changing “... the implementation of the MWD Project” to “the implementation of future water sources projects of the C&SF, *i.e.* MWD and the Comprehensive Everglades Restoration Project”.

Pg. 4, Section 7-04, 1st Paragraph 2nd Sentence – Consider changing “in the 8.5 SMA and to preserve hydroperiods within the Everglades” to “for restoration water depths and hydroperiods in the Everglades”.

Pg. 5, Section 7-05, 3rd Paragraph – Consider changing “Operation of S-357 should not adversely impact the ...” to “Operations of S-357 shall not adversely impact the”

Pg. 5, Section 7-05, 3rd Paragraph 2nd Sentence – Suggest incorporating a reference to the figure labeled “General Map of North East Shark River Slough with Gages” in table of contents either prior to or following this sentence. In addition a reference to the document that codifies the monitoring, evaluation and reporting program is necessary.

Pg. 6, Section 7-05.1.1.1 and 7-05.1.1.2 – The onset of wet and dry season need to be defined with either dates or a sentence that quantifies or qualifies the absence or presence of rainfall for each of these period. Regardless of which method it would be preferable an additional sentence would be included that allows for operational flexibility to assist in transitions between the seasons consistent with the multiple purposes of the project.

Pg. 8, Section 7-05.1.3, 3rd Sentence – “S-335B” should read “S-355B”.

Pg. 8, Section 7-05.1.3, 3rd Sentence – Why not use S-355A TW first, and then either S-333 TW or S-334 HW?

Pg. 8, Section 7-05.1.3, 4th Sentence – Suggest including a statement to the effect that the L-29 stage constraint will be the same as in the IOP table (9.0 ft.), until such time as a final decision is made on the Tamiami Trail LRR (~8.0 ft.).

Pg. 9, Section 7-05.1.4 – Consider removing this section. If the section cannot be removed consider removing, changing or adding as necessary to ensure the intent of operation that 1) pumping at S-356 will be limited to the amount of seepage into the L-31N in the reach between S-335 and G-211; and 2) operations of S-356 shall only be undertaken with S-335, S-336, S-338 and G-211 closed.

Pg. 11, Table 1 Operational Revisions to IOP Table – The gage in the seepage canal needs to be named and located accordingly on the Figure’s 2 and 3. Since the table is going to be incorporated into the IOP operational table the format should be the same and reflect the two modes of operations, *i.e.* No WCA-3A regulatory releases to NESRS or SDCS; and WCA-3A regulatory releases to SDCS. In addition, text should be added to the document to reflect that S-357 operations do not change between the IOP modes of operation.

Monday, March 3, 2008

Trent Ferguson
US Army Corps of Engineers
Jacksonville District
701 San Marco Blvd
Jacksonville FL 32207
MWDWCPComments@evergladesplan.org

Dear Mr. Ferguson:

This letter contains comments related to the draft document *Interim Water Control Plan For Pumping Station S-357* presented at the January 31, 2008 public meeting in Homestead, FL. These comments represent the views of the Everglades Foundation, the National Parks Conservation Association, and the Natural Resources Defense Council.

We begin our comments on the S-357 operations by observing that, because of the currently-proposed Modified Water Delivery Project ("Mod Waters")'s inability to raise water levels in L-29 to the levels envisioned in the June 1992 GDM and in the July 2000 EIS for the 8.5 SMA project, the operations proposed here represent a significant over-mitigation for the level of environmental benefits currently anticipated in Mod Waters.. We are deeply disappointed by the proposed Mod Waters' failure to deliver meaningful environmental benefits, but note that it appears that the Corps intends to deliver fully on the expected flood mitigation benefits. The Corps should not look to provide such high levels of mitigation for an effect that will not occur until Tamiami Trail is significantly modified, which appears unlikely to occur under Mod Waters.

Our second comment is related to the statement of project purpose. Given that the quantities of additional water to be delivered by the current design of Mod Waters are much lower than originally projected, we are concerned by the first sentence of Section 7-04 (page 4), which states:

The levee and seepage collection canal are designed to mitigate for increased flood risk as a result of projected increased water levels in North East Shark River Slough (NESRS) and other portions of the MWD Project.

First, this statement is incorrect. Appendix A, page 20, paragraph 2 of the July 2000 8.5 SMA EIS clearly states that the design for the levee and seepage canal used "D13R", or post-CERP, water levels in Northeast Shark Slough. Thus, the project was designed to mitigate ultimately for the projected water levels from a fully restored condition in Northeast Shark Slough, including a design for Mod Waters that incorporated Tamiami Trail modifications to allow stages to exceed 9.8 ft msl, and other restoration projects like decompartmentalization of Water Conservation Area 3. Second, this statement appears to inappropriately open the door to calls for further mitigation subsequent to completion of the currently-proposed Mod Waters when those

originally planned water levels are actually delivered via other efforts. Third, the statement is inconsistent with the Federal law that approved alternative 6D from the July 2000 8.5 SMA EIS because that alternative assumed the flood mitigation was designed for a post-CERP condition. This statement must be modified to reflect both the actual design condition and to make it clear that the S-357 levee and seepage collection system represent the mitigation for a fully restored, post-CERP water levels in Northeast Shark Slough, i.e., "...projected increased water levels in NE Shark River Slough due to Mod Waters and all other restoration projects." Prior to such restored water levels, the S-357 levee and seepage collection should be limited in use to the extremely minimal impacts of the currently-proposed Mod Waters, if and when implemented.

Our third comment has to do with the assurances that the project will not adversely affect the marshes within Everglades National Park. Section 7-05.1 states

Operation of S-357 should not adversely impact the restoration levels of the ENP hydrology. A monitoring, evaluation, and reporting program shall be implemented to ensure operations are consistent with the anticipated level of service.

This statement lacks specificity, and does not provide the necessary assurances that the project will not adversely affect wetlands. It is critical that the public be provided with specific information concerning the frequency of reports and the types of evaluations proposed, including the specific conditions that would represent an adverse consequence requiring changes in operations. Additionally, a diagram of the proposed monitoring network is needed. Finally, this monitoring network must be in place *before* the pumps are made operational. This is important for purposes of protecting ENP, including providing baseline, or pre-operations, information.

Our fourth comment is related to the operations of S-356 in Section 7-05.1.4 on page 9. This language may represent some sort of inter-agency agreement, but it provides insufficient detail for the public to discern what the proposed operations might actually be. For example, the "mandatory off level" in L-29 is not specified. Also, we do not see the necessary technical details for how the determination will be made for purposes of complying with the statement "Pumping will be limited to the amount of seepage into L-31N in the reach between S-335 and G-211 and the volume released from S-335 minus the portion of the S-335 release (if any) which is discharged through S-338, S-336, and G-211. The actual technical rule needs to be made public for interested parties to make comments upon it, and we cannot do so in this form. Absent this, we cannot adequately comment on the plan's impacts..

Fifth, prior to operation of the S-357 and associated structures, the Corps must obtain a permit issued pursuant to Section 402 of the CWA. In addition, the Corps must evaluate whether operation of the structures will meet state water quality standards and assure such compliance; as the Corps is aware, ENP is classified as an Outstanding Florida Water. We refer the Corps to the data collected, and impacts analyzed, at the variety of proximate and similar structures, including in the South Dade Conveyance System and including components of the Interim Structural and Operation Plan and the Interim Operational Plan.

Lastly, we believe that the Corps has missed an opportunity to apply some of the more forward-thinking and progressive elements of the "Draft Operations Manuals" that were proposed as part of the Guidance Memoranda for CERP. Even though this is a pre-CERP project, this document would be greatly improved by following the format spelled out there, with increased attention to operational philosophies and objectives. This current document, which follows the traditional format, contains the elements of future controversies because of its adherence to outdated templates.

Thank you for the opportunity to comment.

Sara Fain
National Parks Conservation Association

Bradford Sewell
National Resources Defense Council

Thomas Van Lent
Everglades Foundation

**Florida Department of Transportation****CHARLIE CRIST**
GOVERNORDistrict VI Planning & Environmental Management Office
1000 NW 111th Avenue
Miami, FL 33172**STEPHANIE C. KOPELOUSOS**
SECRETARY

March 3, 2008

Trent Ferguson
U.S. Army Corps of Engineers
701 San Marco Blvd.
Jacksonville FL 32207-8175

Dear Mr. Ferguson:

Thank you for the opportunity to review and comment on the Preliminary Draft of the Interim Water Control Plan for Pump Station S-357. The Florida Department of Transportation (FDOT) District Six has reviewed the document and offers the below comments. Please incorporate these comments as part of the record and National Environmental Policy Act ("NEPA") documentation for the decision regarding the Interim Water Control Plan.

It appears that the operations of the S-357 pump station will occur prior to any modifications to Tamiami Trail. Water levels should not be raised above 7.5' in the L-29 until roadway modifications to protect the integrity of Tamiami Trail have been completed unless otherwise approved by FDOT for short duration events. While we understand that operations will be governed by the Interim Operation Plan (IOP) and the bridge and road improvements will be implemented separately, harmonizing these two actions is critical to the safety and integrity of the road. The documents that we have reviewed thus far do not clarify these linkages. We seek a better understanding of the linkage between the bridge and road improvements with the stage elevations proposed in IOP and how this process will be further coordinated.

FDOT remains committed to continuing our coordination with the Corps on this important project as the various components of the Modified Waters Delivery Plan are advanced.

Sincerely,

Aileen Boucle, AICP
District Planning and Environmental AdministratorCc: Gerry O'Reilly, P.E. -FDOT
Alice Bravo, P.E. -FDOT
Gwen Nelson - ACOE
Marie Burns - ACOE
Bob Crim - FDOT
Dan Kimball - ENP
Paul Linton- SFWMD
Barbara Culhane - FDOTwww.dot.state.fl.us



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MyFWC.com

February 28, 2008

Ms. Marie Burns
Acting Chief, Planning Division
Environmental Branch
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

Re: Interim Water Control Plan for Pumping Station S-357, Modified Water
Deliveries to Everglades National Park, Miami-Dade County

Dear Ms. Burns:

The Habitat Conservation Scientific Services Section of the Florida Fish and Wildlife Conservation Commission (FWC) has coordinated agency review of the referenced National Environmental Policy Act document. Our comments and concerns on the Interim Water Control Plan for Pumping Station S-357 are included in the following letter, which is being submitted under the authority of the National Environmental Policy Act of 1969.

Background

This document represents the development of operating criteria for the S-357 pump station. The S-357 pump station is a feature of the final recommended plan Alternative 6D for the Modified Water Deliveries (MWD) to Everglades National Park (ENP) Project, 8.5 Square Mile Area (8.5 SMA) General Reevaluation Report and Supplemental Environmental Impact Statement completed in July 2000. In addition, the Canal 111 (C-111) Project has been modified since the May 1994 Final Integrated General Reevaluation Report (GRR) and Environmental Impact Statement (EIS), as documented in the June 2007 Environmental Assessment and Engineering Documentation Report. Portions of these two projects are being constructed simultaneously and will eventually work in conjunction with each other. The operational integration of these two projects is to be accomplished by the Combined Structural and Operational Plan (CSOP).

This Interim Water Control Plan for Pump Station S-357 will be incorporated into the December 2006 Interim Operational Plan (IOP) for Protection of the Cape Sable Seaside Sparrow and will therefore become the interim operations that will be utilized until the CSOP plan is authorized and fully operational. This project is one of four components that have arisen from the original 1992 MWD General Design Memorandum. The other highly interrelated components include modifications to the Tamiami Trail to permit increased flows beneath the roadway; conveyance of water between Water Conservation Area (WCA)-3A, WCA-3B, and North East Shark River Slough (NESRS); and an overall operational plan for the newly constructed water control structures.

Project Description

Alternative 6D consists of an exterior and interior levee as well as a seepage canal. The levees and seepage collection canal are designed to mitigate for increased flood risk as a result of projected increased water levels in NESRS and other portions of ENP due to the implementation of the MWD Project. The S-357 pump station will maintain water stages

Ms. Marie Burns
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within the interior seepage canal to provide for flood damage reduction (flood mitigation) in the 8.5 SMA and to preserve hydroperiods within the Everglades. The new pumping structure (S-357), located at the southern terminus of the 3.5-mile seepage canal, will discharge seepage water into a flow-way and subsequently into the 183-acre 8.5 SMA Stormwater Treatment Area (STA). There will be no discharge out of the STA until the C-111 Northern Detention Area (NDA) is constructed. Correspondingly, the STA discharge weirs, located along the south side of the STA, will be constructed at heights of 3.5 and 4.0 feet (east and west respectively) above average ground surface. Once the C-111 Canal project's NDA is constructed, the eastern discharge weir will be lowered to allow flow from the STA into the NDA.

The S-357 pump station is designed for a capacity of 575 cubic feet per second (cfs), and consists of four diesel pumps (125 cfs each) and one electric pump (75 cfs). The pump station will discharge into a settling pond with a concrete apron at elevation 1.0 feet. From the settling pond the flow will transition back to natural grade, where the water will flow via an approximately 320 feet wide above ground flow-way to the STA. After the C-111 NDA is constructed, the STA will discharge water into the NDA.

A key provision of this water control plan is the removal of the G-3273 trigger as an operational criterion for controlling flows from WCA-3 into NESRS. Instead, the L-29 borrow canal as measured at the S-355B tail water would be used as the controlling criterion for discharging flows into NESRS. Based on concerns from the Florida Department of Transportation (FDOT) for the integrity of Tamiami Trail between S-333 and S-334, the L-29 canal stage constraint of 9.0 feet from IOP would be lowered to elevation 8.0 feet National Geodetic Vertical Datum (NGVD). Coordination with the FDOT will occur before the transition of the canal stages above elevation 7.5 feet. At a minimum, concurrence with the stage increase above elevation 7.5 feet will be sought from the FDOT each time the canal level is planned to exceed this level due to operations of the system, including an agreement of the time duration that stages will be allowed to stay above elevation 7.5 feet. The FDOT considers that the current Design High Water for Tamiami Trail between S-333 and S-334 to be elevation 7.5 feet; a design high-water stage of 9.7 feet has been contemplated under CSOP planning. Review of historical data does indicate, however, that stages have occasionally risen above elevation 7.5 feet due to direct rainfall and seepage from the area to the north (WCA-3B), independent of current operational schedules. If the L-29 canal stage is too high, then flow will be reduced first by reducing or eliminating S-333 discharges, second by reducing or eliminating the S-355A and S-355B discharges, and finally, by reducing or eliminating S-356 discharges.

Potentially Affected Resources

WCA-3 encompasses approximately 550,000 acres of graminoid wetlands interspersed with various types of tree islands. WCA-3A and WCA-3B are managed by the FWC as part of the Everglades and Francis S. Taylor Wildlife Management Area (EWMA). The EWMA contains about two-thirds of the remaining freshwater Everglades and its wet prairie, slough, and willow strand plant communities provide critical foraging and nesting habitat for snail kites (*Rostrhamus sociabilis plumbeus*), wading birds, and a myriad of other native wetland wildlife. The objectives of MWD address the protection of the natural values of WCA-3A, WCA-3B, and ENP, including the integrity of crucial tree island habitats. Although tree islands occupy a small portion (~1.5%) (Patterson and

Ms. Marie Burns
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Finck 1999) of the Everglades ridge and slough landscape, they are sites of high plant species diversity, provide habitat and wet-season refuges for upland species, and are essential nesting habitat for a variety of wetland reptiles and birds (Heisler et al. 2002). There are several different types of tree islands in the ridge and slough landscape, including (elevated) tropical hardwood hammocks, bay head swamp forests, and willow heads.

We have supporting evidence from the current Everglades system that extreme high water depths of relatively long duration lead to a deterioration of ridge and slough landscape features and to declines in their associated wildlife populations. Southern WCA-3A has experienced severe degradation of its ridge components (sawgrass ridges and tree islands) due to excessive depths and durations during the past 40 years (Heisler et al. 2002, McPherson 1973, Patterson and Finck 1999). Heisler et al. (2002) found that marsh water levels exceeding 2.0 feet led to tree island flooding impacts that were demonstrated by a statistically significant ($P < 0.0001$) reduction in tree and shrub species richness. Fortunately, the central portion of WCA-3A has experienced fewer and less severe episodes of both high water and drought, and harbors some of the best remaining ridge and slough landscape patterns in today's Everglades.

The redistribution of flows across the full breadth of Shark River Slough is important since it is a primary overarching objective of the MWD project. Although hydrological conditions in NESRS have improved under the IOP, this area still possesses lower water depths and shorter hydroperiods than historically occurred here. Consequently, populations of turtles, amphibians, fish, apple snails, and other aquatic invertebrates have remained suppressed, limiting the utilization of NESRS by higher trophic level animals such as alligators (*Alligator mississippiensis*), wading birds, and snail kites.

There are two traditional wading bird rookery sites, the Tamiami East and Tamiami West rookeries located in NESRS immediately south of the Tamiami Trail. Several listed species of wading birds, including the white ibis (*Eudocimus albus*), tricolored heron (*Egretta tricolor*), little blue heron (*Egretta caerulea*), and snowy egret (*Egretta thula*) (all state-listed as species of special concern), and the wood stork (*Mycteria americana*) (state- and federally listed as endangered) are known to nest in one or both of these colonies (Gawlik, 2002). The Everglades mink (*Mustela vison evergladensis*) is listed as threatened by the FWC, and approaches the eastern limits of its distribution in NESRS. Most documented records of Everglades mink have been associated with levees, canals, and fill pads near the Tamiami Trail, with fewer observations from tree islands in this area (Smith 1980).

Based on annual surveys from 1970 to 1998, WCA-3A has been the largest and most consistently utilized of the designated critical habitats for the snail kite (Kitchens et al. 2002). One of the stated objectives of MWD is to maintain suitable marsh vegetation structure that would provide successful foraging habitat for the endangered snail kite both in WCA-3 and ENP. Optimal snail kite foraging habitat is characterized as shallow wet prairie dominated by emergent plant species such as *Panicum hemitomon* and *Eleocharis* spp. (Bennetts and Kitchens 1997, Kitchens et al. 2002). The snail kite feeds almost exclusively on the apple snail (*Pomacea paludosa*), which is more abundant in wet prairies than in adjacent sloughs that are characterized by sparse, floating and submerged

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vegetation such as *Nymphaea odorata* and *Utricularia* spp. (Darby 2003). Shallow wet prairies are maintained where water levels fall below ground surface with a return frequency of dry-down conditions occurring 1 in every 3-5 years, with average flood durations being between 156 and 260 weeks (Kitchens et al. 2002).

Potential Effects of the Draft Interim Water Control Plan

Since this water control plan is part of a restoration plan designed to provide a more natural distribution and timing of flows to NESRS, our comments focus on the ecological benefits to be derived from its implementation. We believe that the removal of the G-3273 constraint as a trigger for curtailing flows into NESRS is an important step towards restoration of this area. However, the new constraint then becomes the stage level of the L-29 canal at the S-355B tail water, which is proposed to be operated at 8.0 feet NGVD (with several caveats) in the water control plan. If the L-29 canal is actually allowed to attain this higher stage (current effective limit is 7.5 feet), then it would be possible to deliver slightly greater volumes of flow to NESRS. These increased flows would lead to an increase in secondary productivity, which in turn should enhance the foraging success of wading birds and snail kites, as well as benefit other wetland dependent wildlife, including the Everglades mink (state-listed as threatened), using NESRS. The additional flows into NESRS, along with the use of the S-357 pump station and water retention areas to help maintain a hydrologic ridge on the eastern boundary of ENP, should also create slightly wetter conditions in the overly dry marl prairie habitat inhabited by Cape Sable seaside sparrow's (*Ammodramas maritimus mirabilis*) subpopulations E and F. An enhanced ability to increase the conveyance of flows from the L-29 canal to the south, and to augment the capacity of the L-29 canal to receive flows from WCA-3, would benefit tree island, snail kite, and wading bird habitat both in southern WCA-3 and in NESRS. However, the realization of these incremental benefits are contingent on the U.S. Army Corps of Engineers' (COE's) success in brokering an agreement with FDOT that permits the COE to regularly raise stage levels in the L-29 canal to 8.0 feet. Absent such an agreement, we believe that this plan is unlikely to result in a significant increase in flows and concomitant increase in ecological benefits to NESRS and WCA-3 that otherwise would be possible.

Lacking any detailed hydrologic modeling of the proposed S-357 pump operations, it is unclear how such operations would affect existing wetlands outside of the seepage canal. The proposed operational plan should insure that existing wetlands outside of the seepage canal are maintained or enhanced as a result of the plan's implementation. Maintaining the integrity of these wetlands will benefit native wildlife and help reduce the spread of invasive exotic plants such as Brazilian pepper (*Schinus terebinthifolius*), melaleuca (*Melaleuca quinquenervia*), and Australian pine (*Casuarina equisetifolia*). Monitoring wells in key areas such as the Federal Aviation Administration property may be needed to ensure that the interim operational plan is performing according to the criteria set forth in Alternative 6D.

Discussions with staff of the South Florida Water Management District suggest that the operation of the S-357 pump station would likely result in very shallow water depths in the 183-acre STA during wet periods. Such shallow water depths would likely attract shorebirds, particularly when standing water occurs during migration. Since south Miami-Dade County is commonly frequented by birders, hunters, and other wildlife

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enthusiasts, we would like the COE to consider supporting public use of this facility, which we understand will be transferred to the SFWMD once construction is complete.

Concerns and Recommendations


In summary, we offer the following concerns and recommendations concerning the draft Interim Water Control Plan for the S-357 Pumping Station.

1. We encourage the COE to seek a more solid agreement with FDOT concerning the 7.5-foot stage constraint in the L-29 canal, and to actively pursue a permanent solution that would allow the stage of the L-29 canal to be raised to a minimum of 8.0 feet NGVD for sustainable periods. This higher stage would provide greater relief for WCA-3 during high water events, and improve the distribution of flows to NESRS, benefiting Everglades' flora and fauna in both areas.
2. We are uncertain as to the effects that the proposed water control plan will have on existing wetlands located outside of the seepage canal, and ask that the COE continue to collect hydrological data from appropriate existing monitoring wells (Angel's well, etc.), as well as evaluate the need to add additional wells, if deemed necessary. If the hydrological data indicate additional drying of these wetlands is occurring, then the COE should revise the water control plan to alleviate the adverse effects.
3. The proposed operations for the S-357 pump station are likely to create suitable habitat for shorebirds and other wildlife in the 8.5 SMA STA. Recreational opportunities for bird watchers, hunters, and anglers should be given serious consideration, pursuant to Florida Statute 373.1391(1). These recreational opportunities are compatible with project purposes and there is a high stakeholder demand for additional recreational opportunities in this area of southern Florida. As such, any additional opportunities would be greatly appreciated by stakeholders and would reflect favorably on the COE for supporting them.

Summary

If you or your staff has any questions about the content of this review, please contact Tim Towles at our office in Vero Beach (772-778-6354; email tim.towles@MyFWC.com). If you would like to coordinate further on the process of our involvement in this and related projects, please feel free to contact me at 850-410-5272 or email me at maryann.poole@MyFWC.com.

Sincerely,



Mary Ann Poole, Director
Office of Policy and Stakeholder Coordination

map/dtt/cc
ENV 1-3-2

Ms. Marie Burns
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Pump Station S 357_1254

CC: Paul Sousa, USFWS, Vero Beach
Dan Kimball, ENP, Homestead
Trent Ferguson, COE, Jacksonville
Christopher Spaur, COE, Jacksonville
Inger Hansen, DEP, West Palm Beach
Chuck Collins, FWC, West Palm Beach
Marsha Ward, FWC, Sunrise
Paul Linton, SFWMD, West Palm Beach

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From: mfortin [<mailto:mfortin@bellsouth.net>]
Sent: Wednesday, February 27, 2008 12:45 PM
To: MWDWCPComments
Subject: Written comments on the Corps Interim Water Control Plan for
Pumping Station S-357

You are currently subscribed to mwdwcpcomments as:
Trent.L.Ferguson@usace.army.mil.
To unsubscribe send a blank email to leave-2058-
5024.d62bcf67cf8ef4536d0ff0204922214b@evergladesplan.org

Trent Ferguson
Feb. 25, 2008
U.S. Army Corps of Engineers
701 San Marco Blvd.
Jacksonville FL 32207-8175

Mr. Ferguson:
Please accept the following written comments on the Corps Interim Water
Control Plan for Pumping Station S-357

When Congress authorized Alternative 6D as the preferred option for the
8.5 Square Mile Area flood protection portion of the Modified Water
Delivery Project the legislative language in the earmark was abundantly
clear. It states that the Corps is being allowed to construct
Alternative 6D "...for the purpose of providing a flood protection
system for the 8.5 square mile area..." Despite this the Corps
continues to maintain that they do not have to provide the remaining
community with flood protection, but only with "flood mitigation"
without ever defining what flood mitigation actually is.

In section 3.0 Description, of the Corps draft Interim Water Control
Plan the Corps again states its continued refusal to provide the
remaining 8.5 Square Mile Area community with the flood protection
ordered by Congress. The Corps states that Alternative 6D of the
Modified Water Delivery project "...is designed to keep the groundwater
levels within the area interior of the outer levee at the same levels as
existed prior to the implementation of the MWD Project" However, the
Corps has refused to state what these groundwater levels were. The
agency has refused to state clearly what level of groundwater
constitutes "...the same levels as existed prior to the implementation
of the MWD Project" This lack of a clearly defined goal for groundwater
levels allows the Corps to keep groundwater at any level they choose.

The Corps continues this section with the following statement "Two
interior levees, one on either side of the seepage canal, are positioned
to prevent surface water from entering the seepage canal." It appears
that the Corps is intending to flood the community since they have
designed the central portion of the project to deal with water above the
surface of the ground. The only way there would be surface water near
the canal is if the entire community were flooded. Surface
water=flooding.

This section ends with the statement that the S-357 pump "...will discharge seepage water into the flowway to the 8.5 SMA STA to be released south into a treatment area in the C-111 project area. Discharges out of the STA will not be allowed until the C-111 Northern Detention Area (NDA) is constructed."

This statement is flawed in a number of ways. The Corps SEIS on Alternative 6D never defined how the project would be operated so there was no opportunity for public review of the proposed operating plan. During CSOP Advisory committee meetings the Corps refused to discuss in any detail where the water discharged from the S-357 pump would go after it was pumped into the impoundment area. The CSOP Advisory Committee was formed for the express purpose of allowing impacted stakeholders the opportunity of making recommendations to the Corps on how the Modified Water Delivery and the C-111 projects would be operated. Yet the Corps withheld vital information on how they intended to operate this portion of the project from committee members.

Despite what the Corps says in this draft Interim Water Control Plan, once water has been pumped into the impoundment areas it will not flow south overland. Water must either flow downhill or have a force behind it, pushing it forward for it to flow overland. The land making up this series of impoundment areas is so flat that the water stays in the impoundment areas once it is pumped there. Testing carried out for the South Dade Soil and Water Conservation District showed that the water in the impoundment areas constructed by the Corps as part of the C-111 Project did not flow anywhere. It simply soaked into the ground and flowed east, underground, back into L-31 North canal. In other words the Corps is pumping water around in a circle. As the impoundment areas south of pump S-357 are just as flat and just as porous as the land in the C-111 impoundment areas there is no reason to expect that the water in the 6D impoundment areas will behave any differently.

This raises an important point-because the water in the impoundment areas will seep into the ground and then flow east into L-31 North canal, the downstream stages in L-31 North will be the determining factor in the operations of the S-357 pump. The Corps is aware of this limiting factor. In discussing the actual operating criteria for the use of S-357, Section 5.1.2 S-331 (b) and (c) sneak in the following disclaimer "...if permitted by downstream conditions." This section also states that S-331 can not be used to move water if the canal levels downstream of S-331 are above 6 feet NGVD. So downstream canal levels in L-31 North canal will be used as an excuse not to use the S-331 or S-357 pumps.

This section states that if the water level in the seepage canal is between 5.5 and 6.0 feet NGVD, the water level in L-31 North canal, upstream of pump station S-331, will be maintained at or below 5.0 feet NGVD. But since the water pumped by S-357 will be pumped into an impoundment area where it will seep underground into L-31 North canal, downstream of S-331, it will not be possible to use either S-331 or S-357 to provide any flood relief to the remaining 8.5 SMA community. The Corps covers itself with the handy disclaimer "...if permitted by downstream conditions."

If the Corps had operated the S-331 pump as its operating criteria dictated, most of the flooding experienced by the 8.5 SMA would have

been avoided. Instead, the Corps and the SFWMD used the "lack of downstream capacity" as an excuse for not using S-331 to reduce ground water levels. Downstream capacity could be easily created by opening gates downstream of S-331-but then the Corps and the SFWMD would not be able to flood our helpless community. There is no reason to expect that the operation of S-357 will be any different.

The draft control plan states that the S-357 pump will be operated according to the water levels in the seepage canal. Pumping cannot begin until the water levels in the seepage canal reach 8.5 feet NGVD. As a result of the Corps current canal operations during the rainy season groundwater levels at Angel's Well can be 3 feet above the water levels in the L-31 North canal, even when S-331 was pumping. There is no reason to suppose that the same thing will not happen in regards to water levels in the seepage canal. If water levels in the seepage canal are allowed to get as high as 6.0 feet NGVD, there is no reason not to expect that ground water levels could be as much as 3 feet higher-meaning that most of the remaining community could have water levels of 9 feet NGVD. This would result in much of the remaining community being flooded for months at a time.

Residents have wondered for years why the Corps has refused to provide our community with the flood protection Congress ordered them to provide. Aside from the fact that the Corps "grew" the original project component for the 8.5 SMA from an \$18 million project to a \$300+ million dollar project, was there any other other reason for the Corps actions?

Although the Corps maintains that Alternative 6D has "significant" environmental benefits for Everglades National Park, there was no data supporting this allegation in the SEIS the Corps published on Alternative 6D in July 2000. Computer generated hydrographs published in the SEIS show ground water levels from the Corps original project, which protected the entire 8.5 SMA community, as being virtually identical to ground water levels generated by the Corps chosen project 6D in Northeast Shark River Slough (NESRS). (Volume 2, Appendix A, figure 63)

Table 8 in Volume 1, Section 2.0, of the SEIS notes the amount of additional water supplied to NESRS for 6D and the original project as follows:

	<u>Original Project</u>	<u>6D</u>	<u>Difference</u>
Minimum stage (in feet)	6.61	6.84	0.23
Maximum stage	8.05	8.25	0.20
Acres with increased water depth	59,360	62,068	2,708

This averages out to, at most, an additional 2.5 inches of water on 2,708 more acres of land in North East Shark River Slough from alternative 6D as compared to the original alternative that protected the entire community. There are approximately 64,000 acres in NESRS so the area with an increased depth of 2.5 inches represents only 4.23% of the land in NESRS.

Table 8 also states that the original project provided 39 continuous weeks of inundation in Northeast Shark River Slough, while alternative 6D provided 45 weeks of continuous inundation. Thus alternative 6D is expected to raise the level of ground water on 4.23% of the land in NESRS an average of 2.5 inches for 6 weeks a year over the alternative

that protected the entire community. 2.5 inches of ground water on only 4.23% of land in NESRS for an additional 6 weeks a year can hardly be described as "significant." especially at a cost of \$300+ million. This seems an exorbitant cost for a project that does not do what Congress intended it to do (provide flood protection for the 8.5 SMA community) and which, according to the Corps own SEIS, has limited environmental benefits. In fact it would seem that the only actual benefit of the 8.5 SMA portion of this project is to provide the rock mining industry with mitigation credits. 655 credits to be exact according to the Corps calculations on page 5-14 of the SEIS the Corps published on rock mining in the Lake Belt area of Miami-Dade County. this document states that the destruction of our homes and farms, the removal of house pads and fill will provide the rock mining industry with the mitigation credits it needs to continue to mine untouched wetlands in the Lake Belt area of the county.

In 1997, when the need for mitigation credits became law, the rock miners had to scramble to try and find these mitigation opportunities. There are a limited number of areas in Miami-Dade County that could be purchased or used to provide the rock mining industry with these needed mitigation credits. Whose land could be taken? Certainly not Coral Gables, Homestead or Kendall. The 8.5 Square Mile Area, however, is defenseless, populated mainly by poor minority farmers, many who do not speak English. It would seem that this helpless community is the perfect area to provide the powerful rock mining industry with the needed mitigation credits.

IN CONCLUSION

As soon as the need for mitigation opportunities for the rock mining industry became necessary the 8.5 Square Mile Area was singled out to provide the needed mitigation credits. The Corps was happy to oblige their friends the rock miners since it enabled them to expand an \$18 million project into a \$300+ million project. The Corps was ordered by Congress to design and build a flood protection system for the 8.5 Square Mile Area. Rather than do as Congress ordered them to do the Corps designed constructed a project that does not provide the remaining community with flood protection and has negligible environmental benefits. As the project is being paid for by the Department of the Interior it looks like DOI has subsidized the rock miners need for mitigation credits to the tune of \$300+ million. It could also be said that the helpless residents of the 8.5 Square Mile Area also subsidized the rock miners need for mitigation credits with the pain and suffering of losing their homes and farms and their loss of respect for a government they trusted.

Such a deal!

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APPENDIX C

PROPOSED INTERIM OPERATING CRITERIA

8.5 SQUARE MILE AREA PROJECT

C.1 Project Authority

The Everglades National Park Protection and Expansion Act, (PL101-229, Section 104, December 1989), authorized the Secretary of the Army, upon completion of a General Design Memorandum (GDM), to modify the Central and Southern Florida Project to improve water deliveries to Everglades National Park (ENP) and to take steps to restore ENP natural hydrological conditions. These modifications were specified in a GDM completed by the USACE in 1992 entitled *Modified Water Deliveries to Everglades National Park* (MWD GDM). In June 1992, the MWD GDM was approved by the Chief of the Engineering Division, Directorate of Civil Works and US Army Corps of Engineers (USACE). This approval fulfilled the requirements of Section 104 of the 1989 Everglades National Park Protection and Expansion Act (Act), which directed the Secretary of the Army to select the plan that accomplished the goals of MWD to the extent practicable.

In regards to flood protection for the Eight and One Half Square Mile Area, the Act states: “If the Secretary of the Army makes a determination pursuant to subsection (b) that the Eight and One-Half Square Mile Area will be adversely affected, the Secretary of the Army is authorized and directed to construct a flood protection system for that portion of presently developed land within such area.”

Although the Act states “flood protection”, it is clear that such protection is to be limited to that which would be necessary to protect against impacts as a result of implementation of the MWD Project. To alleviate the potential adverse effects on the Eight and One half Square Mile Area (8.5 SMA) due to implementation of the MWD Project, a number of alternatives were analyzed during the development of the 1992 GDM. Since the intent was to provide protection against impacts caused by the project and not to provide complete flood protection, use of the term “mitigation” versus “protection” was adopted by the USACE in the 1992 GDM.

A component of the Authorized Plan in the 1992 GDM included the construction of a flood mitigation system for the 8.5 SMA consisting of a levee, berm and seepage collection system surrounding the area to the north and west which ties into L-31N.

Following project authorization in 1992, there have been several studies of the 8.5 SMA flood mitigation component. Expanded scientific ecosystem restoration knowledge and significant improvements to hydrologic modeling capabilities have enhanced our understanding of the restoration requirements of the Everglades ecosystem. The need to integrate the MWD Project with the C-111 Project, which has been designed and partially implemented, and the Comprehensive Everglades Restoration Plan (CERP) became evident. The South Florida Water Management District (SFWMD), ENP, and others suggested additional potential options that

would meet the legislated mitigation requirements and other interests in the 8.5 SMA while ensuring environmental restoration of North East Shark River Slough (NESRS). Consequently, the SFWMD, ENP, and others have suggested the flood mitigation system approved by the USACE in 1992 may no longer represent the best alternative for attaining full restoration of NESRS while simultaneously meeting the need for a flood mitigation system in the 8.5 SMA.

The SFWMD, as the local sponsor, has reviewed the subsequent analysis of the cost of construction, operation, and maintenance of the authorized 1992 GDM flood mitigation components, along with new information and technologies. This evaluation prompted the SFWMD Governing Board to request that the USACE evaluate additional alternatives with respect to the 8.5 SMA.

C.2 General Overview

The 8.5 Square Mile Area Project component is the result of the Modified Water Deliveries to Everglades National Park, 8.5 Square Mile Area General Reevaluation Report and Final Supplemental Environmental Impact Statement (July 2000). One of the other components of the Modified Water Deliveries to Everglades National Park Project is the future Tamiami Trail Modifications component which will eventually provide increased water from Water Conservation Area 3 to Northeast Shark River Slough. The 8.5 Square Mile Area features are designed to mitigate for the increased flood risk associated with these planned increased water levels in North East Shark River Slough due the future Tamiami Trail Modifications.

The water management operating criteria proposed below are interim and subject to change prior to completion of the ongoing long-term construction of the MWD Project and the C-111 Project. The 8.5 SMA Project features will work in conjunction with the existing S-331 pump station which is the flood control structure for the immediate area.

C.3 Project Features

C.3.1 Exterior Levee

The L-357W exterior levee, between North East Shark River Slough and the 8.5 SMA (**Figure 2**), acts as a barrier between the 8.5 SMA Project Area residents and Everglades National Park. The exterior levee (L-357W) is approximately 6.75 miles long and is designed with a 20 foot crown width, 10.2 foot top elevation and 1V to 3H side slopes.

C.3.2 Seepage Collection Canal and Interior Levee

A seepage collection canal (C-357), between L-357W and L-31N (**Figure 2**) is intended to maintain surface and groundwater levels between these two levees at the same levels as existed prior to the implementation of the MWD Project. The seepage canal (C-357) is approximately 3.5 miles long with a canal invert elevation varying from -8.5 to -6.09 feet and a bottom width varying from 25 to 30 feet. There are 5 culvert structures allowing road crossings over C-357 (**Figure 2**) ; SW 136th Street (S-358C), SW 197th Ave (S-358B), SW 199th Ave (S-358A) SW 152nd Street (S-358D) and SW168th Street (S-358E). The design criteria of these culvert structures are located in **Table 1**. The interior levee (L-357) surrounding the C-357 (**Figure 2**) has a 12 foot crown width, 9.5 foot top elevation and 1 Vertical to 3 Horizontal (1V to 3H) side slopes. L-357 will prevent surface water runoff from directly entering C-357.

C.3.3 Detention Cell

The detention cell (**Figure 2**) is contained by several levee segments (L-359), (an approximate combined length of 3 miles) have a 12 foot crown width, 1V to 4H side slopes, and a top elevation of 13 feet. The detention cell weirs (S-360W and S-360E), located along the south side of the detention cell (**Figure 2**), have crest elevations of approximately 3.5 feet (elevation 10.5 feet) and 4 feet (elevation 11.0 feet) above grade for the east and west locations, respectively. Design criteria for S-360W and S-360E are contained in **Table 2**.

C.3.4 Monitoring Gages

Gages in the area are listed below and shown on **Figure 3**. G-3272 is currently used to monitor stages in NESRS which in turn limits outflows into the L-29 borrow canal through S-333 or S-355A/B when G-3273 exceeds 6.8 feet. The 8.5 SMA Project in conjunction with Tamiami Trail Project is intended to be operated to reduce or remove this constraint.

Monitoring Gage	Operating Agency	Measurement
G-596	USGS	Groundwater
G-3272	USGS	Groundwater
G-3273	SFWMD	Groundwater
Angel's Well	SFWMD	Groundwater
Las Palmas	SFWMD	Surface water
S-357	SFWMD	HW, TW, RPM
S-331	SFWMD	HW, TW, RPM
G-211	SFWMD	HW, TW, Gate Opening

C.3.5 Pump Station and Flowway

Pump station (S-357), at the southernmost point of C-357 (**Figure 2**), pumps seepage water (collected and drawn into C-357) from C-357 into a detention cell which is contained by the L-359 levees. A flowway between S-357 and the detention cell contains a 400 foot weir (S-359) approximately 2.5 feet above grade (elevation 9.5 feet) located at the southern end of the flowway (**Figure 2**) allowing water to flow from S-357 to the detention cell. The S-357 pump capacity is 575 cubic feet per second (cfs) and consists of 4 diesel pumps (125 cfs each) and one electric pump (75 cfs). Design criteria for S-359 are contained in Table 3, design criteria for S-357 are contained in **Table 4**.

C.4 Proposed Interim Operating Criteria

C.4.1 Objective

The objective of the proposed interim operating criteria is to maintain the surface and groundwater levels between L-357W and L-31N (within the 8.5 SMA) at the same levels expected prior to the implementation of any MWD Project components, while preserving hydroperiods near the 8.5 SMA.

C.4.2 S-357 Water Management Operations

S-357 pumping operations will be based on C-357 water levels at the Las Palmas gage and the G-3273 gage (located in Everglades National Park). The G-3273 gage defines “wet and dry” conditions as greater than or less than 6.8 feet, NGVD, respectively. Under both “wet and dry” conditions, S-357 will not pump more than 500 acre-feet per day. S-357 pumps will be turned off to prevent overflow of the detention cell. A summary of the interim operating criteria is shown below:

During “wet” conditions, S-357 may be operated up to 500 acre-feet per day to maintain C-357 at the Las Palmas gage between 5.2 and 4.9 feet, NGVD. The pump(s) will be off when the Las Palmas gage is less than 4.9 feet, NGVD.

During “dry” conditions, S-357 may be operated up to 500 acre-feet per day to maintain C-357 at the Las Palmas gage between 5.7 and 5.4 feet, NGVD. The pump(s) will be off when the Las Palmas gage is less than 5.4 feet, NGVD.

C.4.3 S-331 Operational Flexibility When S-357 is Pumping

The 8.5 SMA Project features will work in conjunction with the existing S-331 pump station which is the flood control structure for the immediate area. S-331 can also be used for water supply. Flood control or water supply can be accomplished by

siphoning through the pumps or by pumping. S-331 has three diesel driven pumps capable of pumping a total of 1160 cfs (387 cfs each).

Pursuant to existing operating criteria for S-331 (S-331 off criteria), discharges through S-331 can be made if the S-331 tail water (TW) stage is below elevation 6.0 feet and the S-176 headwater (HW) stage is below 5.5 feet, NGVD. If either of these water levels downstream of S-331, is exceeded, discharges at S-331 will be terminated until the S-176 HW stage recedes to elevation 5.0 feet and the S-331 TW is at or below elevation 6.0 feet. If heavy rainfall is forecasted S-331 discharges will be terminated when the S-176 HW stage is between elevations 5.0 feet and 5.5 feet.

Angel's Well is currently referenced for S-331 flood control operations, however during this interim period, the Las Palmas gage can also be considered in the determination of S-331 flood control operations.

a) Existing S-331 operations include the ability to make WCA-3 regulatory releases to the South Dade Conveyance System, if permitted by downstream conditions (existing S-331 off criteria). This includes conveying water from S-334 (excess water from WCA-3), the ability to convey excess water from the L-30 Canal via S-335, the ability to convey excess water from L-31N between S-335 and G-211 (S-336 closed or discharging east), or a combination of these sources for low S-332B and S-332C pumping rate (125 cfs or less per pump station). These low pumping rate operations can be initiated below the flood control operation levels.

b) If Angel's Well or the Las Palmas gage is between elevations 5.5 and 6.0 feet the average daily water level upstream of S-331 may be maintained between elevations 4.5 feet and 5.0 feet if permitted by downstream conditions.

c) If Angel's Well or the Las Palmas gage is above elevation 6.0 feet the average daily water level upstream of S-331 will be maintained between elevations 4.0 feet and 4.5 feet, if permitted by downstream conditions (existing S-331 off criteria).

d) If pumping (500 acre feet per day) at S-357 does not effectively lower Las Palmas water level and/or detention cell water level is causing pumping to cease at S-357, Angels Well criteria will be followed for S-331 pumping.

C.4.4 Detention Cell

Overflow events from the detention cell will not be allowed. S-357 pumps will be turned off to prevent overflow of the detention cell when stages within the southern

part of the detention cell at the S-360E have risen to elevation 10.0 (0.5 feet below S-360E weir crest).

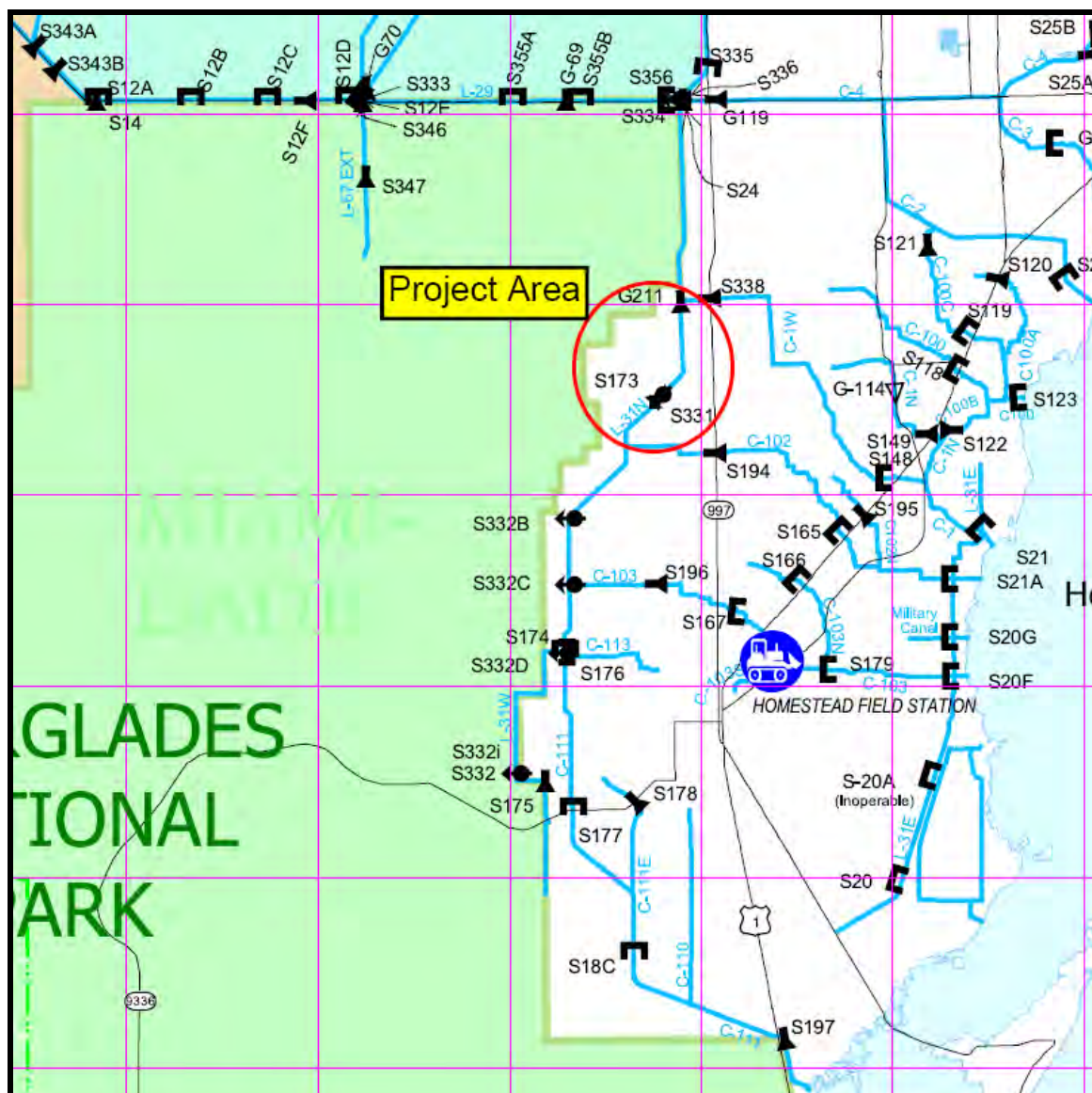


Figure 1: General Location Map

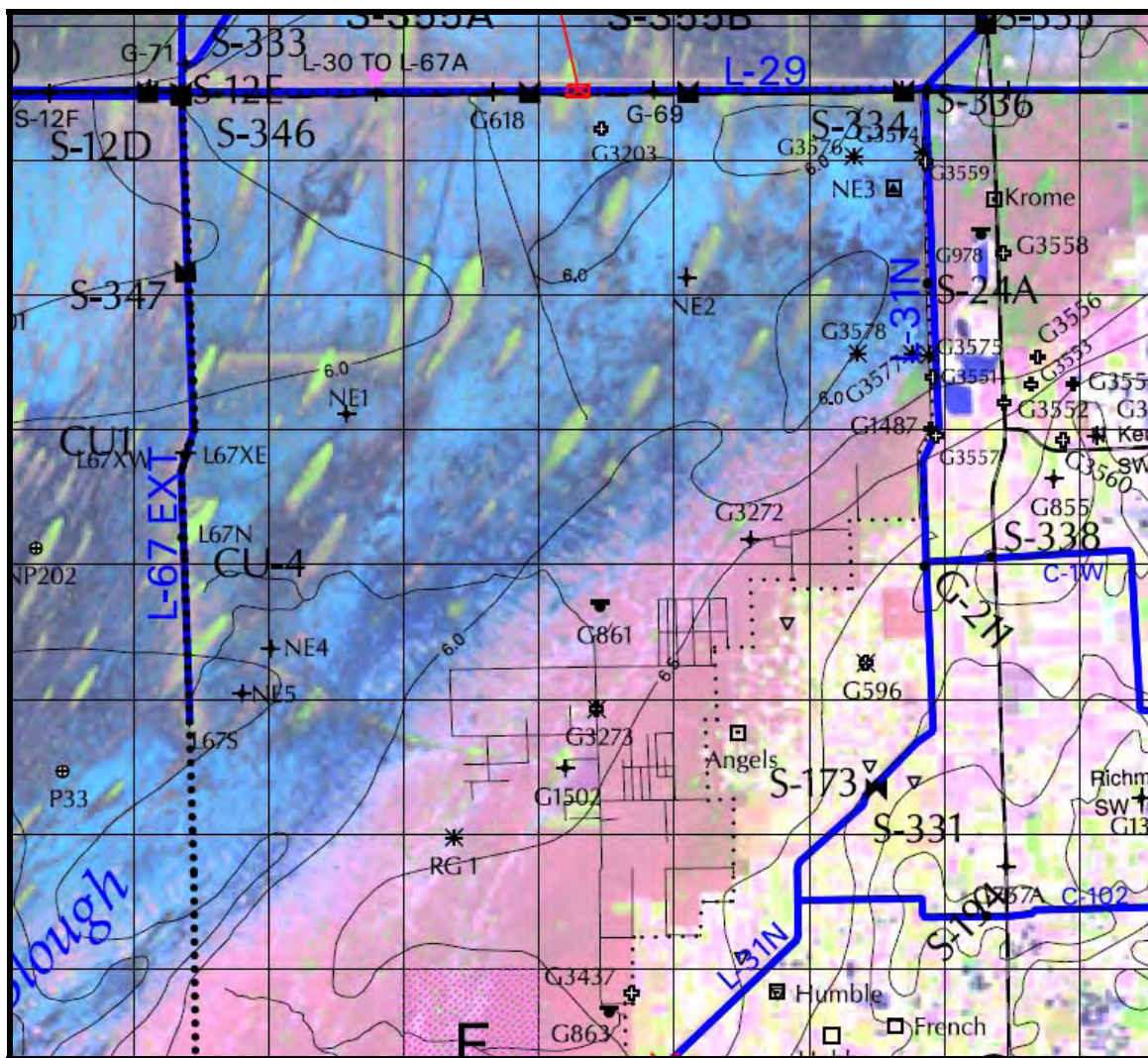


Figure 2: Gage Locations in NESRS

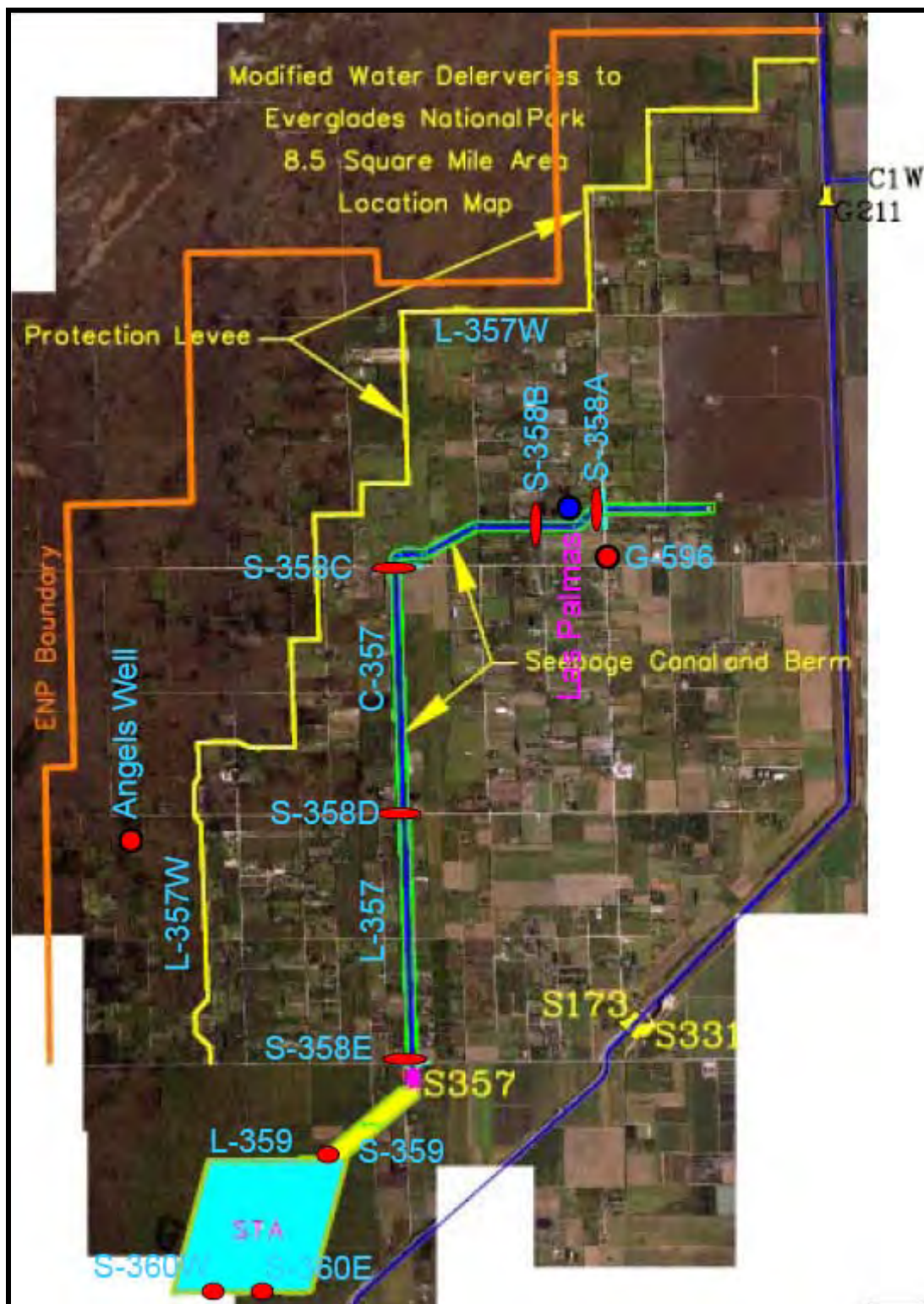


Figure 3: 8.5 SMA Feature Layout

Table 1: Canal Crossing Culverts (S-358A, B, C, D, and E)

Location: At the C-357 canal crossings of SW 136th Street (S-358C), SW 197th Ave (S-358B), and SW 199th Ave (S-358A), SW 152nd Street (S-358D) and SW 168th Street (S-358E).

S-358 A, B and C	
Number of Culverts	2 per site
Culvert Diameter	10 feet
Material	Corrugated Aluminum Pipe
Culvert Length	135 feet (S-358A and B)
	149 feet (S-358C)
Culvert Invert	-6 feet NGVD (S-358A and B)
	-8.5 feet NGVD (S-358C)

S-358 D and E	
Number of Culverts	2 per site
Culvert Diameter	12 feet
Material	Corrugated Aluminum Pipe
Culvert Length	149 feet
Culvert Invert	-8.5 feet NGVD

Table 2: S-360E and S-360W STA Overflow Weirs

Location: Within the southern portion of the detention cell levee (L-359).

S-360 E	
Length	400 feet
Crest Elevation	10.0 feet NGVD
Control	None (Passive Broad Crested Overflow Weir)

S-360 W	
Length	400 feet
Crest Elevation	10.5 feet NGVD
Control	None (Passive Broad Crested Overflow Weir)

Table 3: S-359 Flowway Weir

Location: Approximately 2,000 feet south of 168th Street (Richmond Drive) at the southern end of the flowway.

Purpose: Control of the flowway is by a 400 foot weir approximately 2.5 feet above grade (elevation 9.5 feet) at the southern end before entering the detention cell. This structure is designed to hold a certain depth of water in the flowway to prevent erosion along the levees.

Weir is designed to pass S-357 peak discharge with approximately 0.75 feet of head.

S-359	
Length	400 feet
Crest Elevation	9.5 feet NGVD
Control	None (Passive Broad Crested Overflow Weir)

Table 4: Hydraulic Design Data for Pump Station S-357

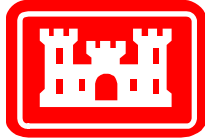
Location: Western Miami-Dade County, within the 8.5 Square Mile Area at the southern end of Canal 357 (C-357), approximately 4,000 feet west of L-31N along Richmond Drive.

S-357 Pump Station		
Design Capacity		575 cfs
Number of Pumps		5
Pump Mix Type and Size		
	Diesel (# @ capacity, each)	4 @ 125 cfs
	Electric (# @ capacity, each)	1 @ 75 cfs
Intake Water Surface Elevations		
	Maximum Pumping	9.5 feet
	Maximum Non-Pumping	7.0 feet
	Normal Pumping	5.0 feet to 6.5 feet
	Start Pumping	5.2 feet Wet 5.7 feet Dry
	Normal Drawdown Pumping	4.9 feet
	Minimum Pumping	0.0 feet
	Minimum Non-Pumping	0.0 feet
Discharge Water Surface Elevations		
	Maximum Pumping	11.0 feet
	Normal Pumping	6.0 feet to 9.0 feet
	Minimum Pumping	5.0 feet
	Minimum Non-Pumping	5.0 feet
Channels & Approaches		
	Channel Bottom Width	30 feet
	Side Slopes	1V:1H 1V:3H above Miami Oolite (Near surface)
	Intake Channel Invert	-8.5 feet
	Discharge Pond Invert	1.0 feet

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APPENDIX D

MODBRANCH REPORT



**US Army Corps
of Engineers**
Jacksonville District

DRAFT October 2008

MODBRANCH Modeling Summary for 8.5 Square Mile Area (S-357)

**Prepared by the U.S. Army Corps
of Engineers,
Jacksonville District**

Prepared by

Robert A. Evans, Water Resources Engineering Branch

Introduction

The MODBRANCH model was used to estimate the impacts of the proposed operations of S-357 on the 8.5 Square Mile Area (8.5SMA) and the regional area.

Only two scenarios were examined. The first scenario is the existing condition under the Interim Operational Plan (IOP) operations, referred to as Alt7R; ALT7R was the recommended alternative in the 2002 IOP Final EIS and 2006 IOP Final Supplemental EIS. The second scenario is with the 8.5SMA Alternative 6D (“6D”) in place, with S-357 and S-331 operations modified as specified in proposed operating criteria. Alternative 6D represents the recommended plan from the 8.5 SMA GRR and FSEIS (USACE, 2000).

Model Selection & Utilization

Because of the complex interaction between the Biscayne Aquifer and various drainage canals, simulations of a number of projects have been performed using the MODBRANCH model. These include the original 8.5SMA study (2000), the CSOP study (2006), portions of the Biscayne Bay Wetland study (2007), and the C-111 Spreader Canal Study (2008). For each of these studies, the model domain has been expanded and refined, depending on the requirements of the study. The Hydrologic Modeling Section of the Engineering Division, Jacksonville District, Corps of Engineers, was requested in May 2008 to provide a MODBRANCH simulation of the proposed operating criteria for the S-357 and S-331 pump stations and to provide documentation of the range of effects observed within the 8.5SMA and adjacent areas.

MODBRANCH is a hybrid code that couples MODFLOW, a three-dimensional groundwater flow model with BRANCH, a one-dimensional canal routing model. The model code was originally developed by the United States Geological Survey (USGS). E. D. Swain and E. J. Wexler of the USGS coupled the models. More information on the creation of MODBRANCH may be found in “A Coupled Surface-Water and Ground-Water Flow Model for Simulation of Stream-Aquifer Interaction,” (Swain and Wexler, USGS Open File Report 92-138). The U.S. Army Corps of Engineers further modified the model to more accurately represent the characteristics of the South Florida area.

Figure 1 shows the model domain superimposed on an aerial photograph of the area. This figure illustrates the complexity of the area. Land elevations vary from the high Atlantic Ridge to the low Everglades. Land use varies from urban to suburban to agricultural to wilderness. Three model domains are shown. The magenta boundary marks the domain of the original “South Dade”

model used in the 8.5SMA 2000 study. The white outline shows the domain used for the CSOP study (2006). The blue shows the domain for the C-111SC study (2008). While there are significant differences between the 2000 domain and the 2006, the change between 2006 and 2008 is primarily the addition of Water Conservation Area 3B (WCA3B). Other differences between the models are the number and resolution of the grid cells.

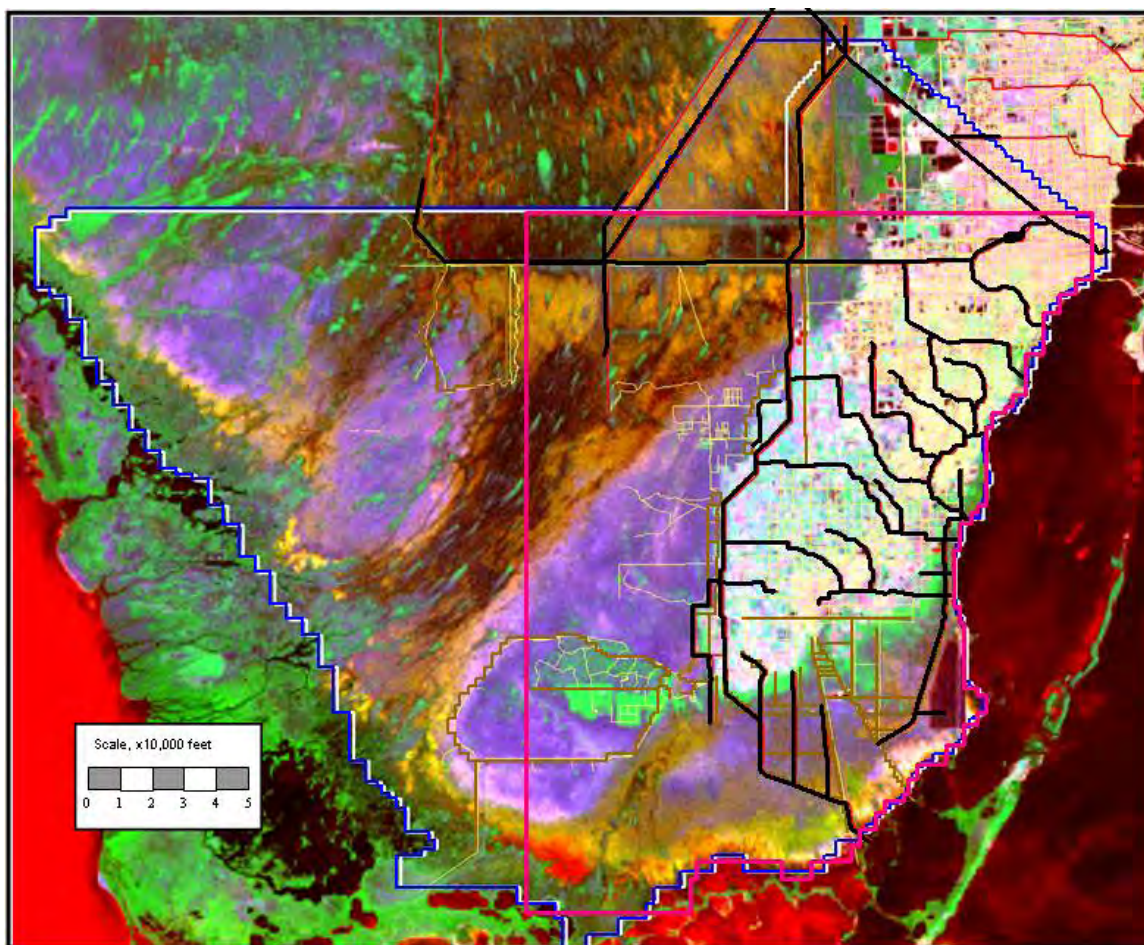
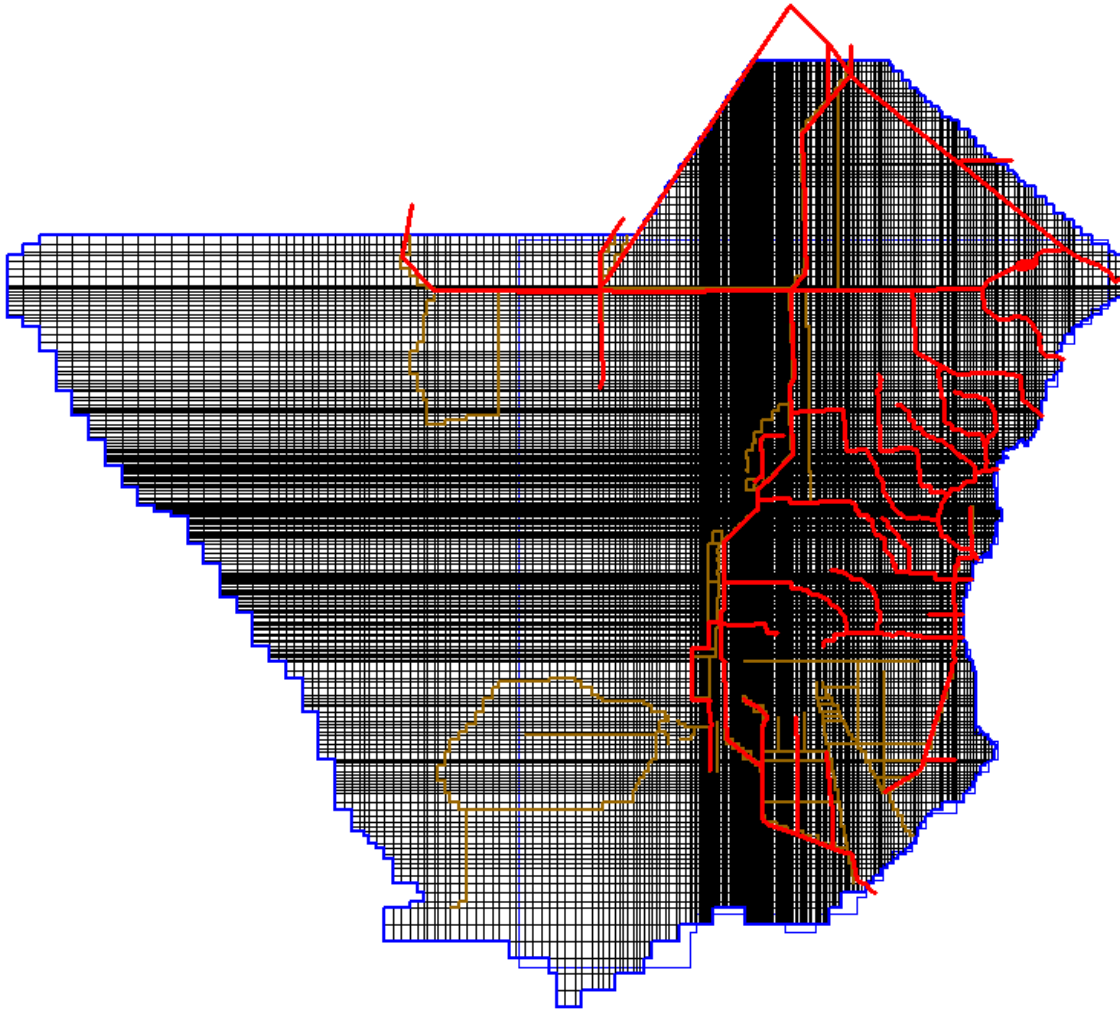


Figure 1: MODBRANCH domains superimposed over aerial image

Both ground water and overland flow are simulated by the MODFLOW part of MODBRANCH. MODFLOW is a pseudo-three-dimensional, finite difference, ground water model (McDonald and Harbaugh, 1988). This model requires defining a model “grid” of specified numbers of rows, columns, and layers. The width of each row or column is determined by required resolution in specific areas.

The model grid used for this project is shown in [figure 2](#) with major canals superimposed. The model is bounded by the Biscayne Bay to the east; Florida Bay to the south; and, the Gulf of Mexico to the west. The northern boundary

is roughly 2 miles north and parallel to the following canals: C-6, L-67C, and L-29. The model grid is made up of 239 rows, 259 columns, and 5 layers. The grid resolution varies horizontally from a minimum of 207 feet to a maximum of 5000 feet. Levees and major roads are defined by using the *horizontal flow barrier* package of MODFLOW and are shown in brown in [figure 2](#).



**Figure 2: MODBRANCH Model Doman and Grid Resolution
(Primary Canals are in red)**

The primary aquifers in the study area are the Biscayne and the Gray Limestone aquifers. The Biscayne aquifer is the dominant feature in the eastern part of the model while the Gray Limestone aquifer is the dominant feature of the west. Other hydrogeologic layers include the Gray Limestone confining unit and the surficial sediments (peat, muck, caprock, fine sand, marl, and marsh sediments).

Model Development & Calibration

The U.S. Army Corps of Engineers, Jacksonville District, made additional model refinements and extended the model domain which was used in previous studies, as mentioned above. Further information on the model development and the calibration can be found in “Calibration and Verification of the MODBRANCH (MB_2006) Numerical Model of South Florida” (Robert A. Evans, July 2007).

Model Inputs & Assumptions

A large amount of data is required to construct any numerical model. For the MODBRANCH model the input data and the assumptions are critical. For this study the required input data included topography, hydrogeology, rainfall, evapotranspiration, water sources, water sinks and behavior of various canal structures.

Topography

Elevation data were developed using various data sources by the Everglades National Park, the Corps of Engineers, and the United States Geological Survey. The data were from a variety of sources as no single source covers the model domain (figure 3). Each source has differing degrees of stated accuracy with the highest accuracy being +/- 0.5 feet and the lowest accuracy being +/- 2 – 4 feet. Figure 4 shows the model topography.

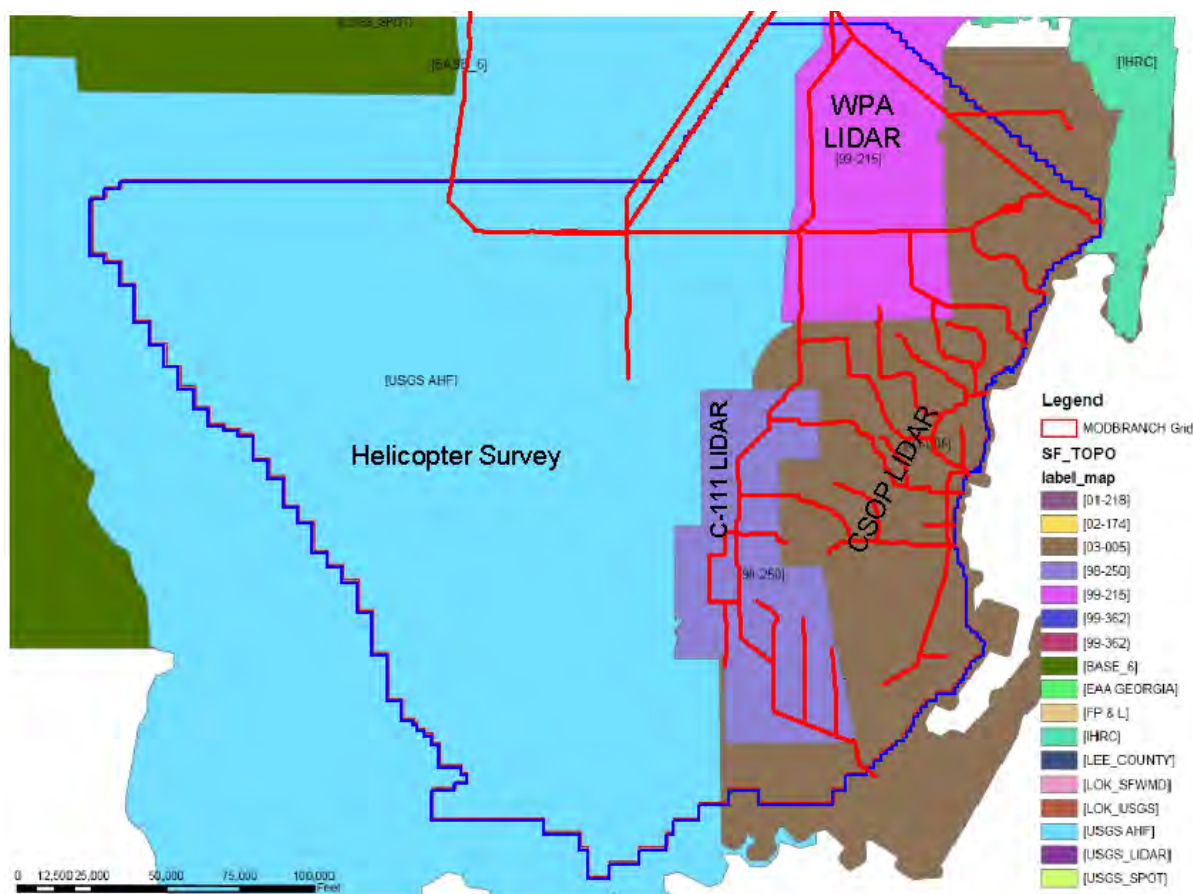


Figure 3: MODBRANCH MB_2006 Topographic Data Sources

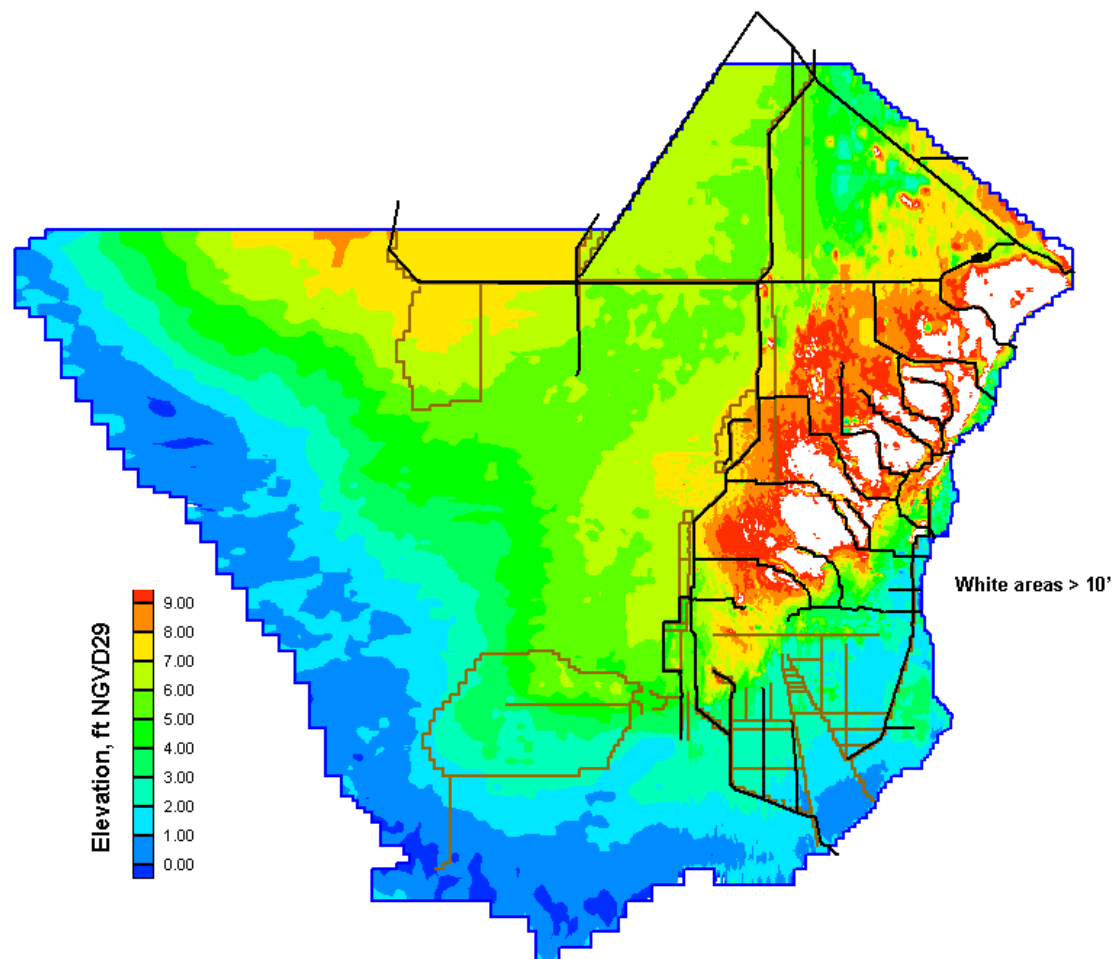


Figure 4: MODBRANCH MB_2006 Topographic Elevations

Hydrogeology

The hydrogeology of the study area has been studied extensively by many investigators. The study area is underlain by the porous Biscayne Aquifer, which is part of the Surficial Aquifer system. The location and extent of the Surficial Aquifer system was defined by the Florida Geologic Survey based on recommendations of the Southeastern Geological Society in 1986. It consists of undifferentiated sand and gravel or marine limestone. In this case, the marine limestone of primary importance is the Biscayne Aquifer. The Biscayne Aquifer, of Pleistocene age, is the main potable aquifer in South Florida. It covers an area of approximately 4,000 square miles including all of Dade County (Randazzo & Jones, 1997). The Biscayne Aquifer consists of beds of highly permeable limestone and sandy-limestone of marine origin. The bottom of the Biscayne Aquifer is characterized by an abrupt change in sediment type where clays and marls of the Tamiami Formation or Hawthorn Formation are present. The Biscayne Aquifer is mostly an unconfined aquifer, although

segments may exhibit semi-confined conditions. In general, the Biscayne Aquifer is well connected to surface water features including the various drainage canals that are located in the South Florida study area.

The MODBRANCH model utilizes five layers to define the hydrogeology of the study area. The top layer of the grid is used to simulate free surface, overland flow. As such, it is defined with a bottom elevation that is set at ground surface.

The stratigraphic sequence of aquifers varies throughout the model and is not uniform. There are “lenses” and “pinch-out” zones that are not known, but are obviously present. In order to build MODFLOW input files that described the layering certain assumptions had to be made. The domain was divided into five stratigraphic sequence regions ([figure 5](#)). The layers of each stratigraphic sequent region were defined differently and are listed in [table 1](#).

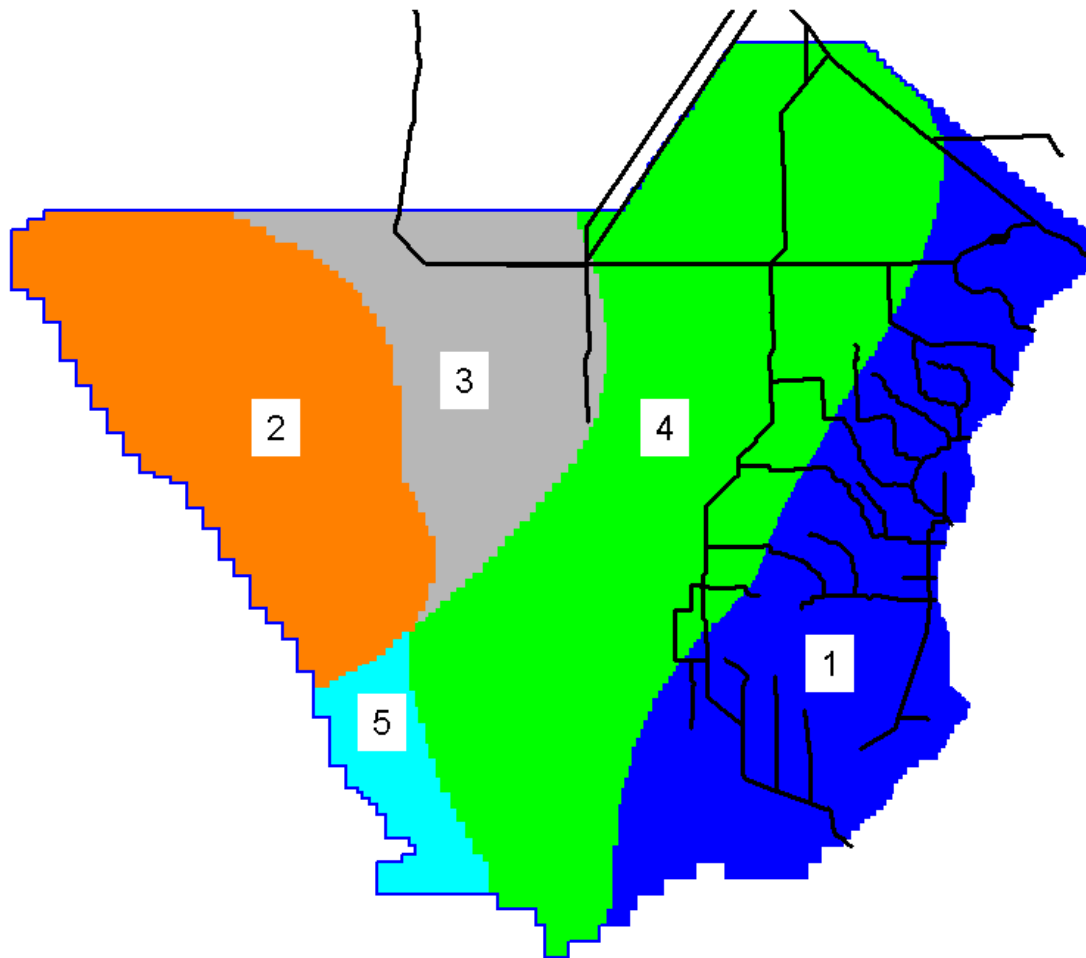


Figure 5: MB_2006 Stratigraphic Sequence Regions

Table 1 : Layers by Sequence

Sequence #	<i>Direction of increasing depth →</i>				
	Layer 1	Layer 2	Layer 3	Layer 4	Layer 5
1	Overland Flow	Surficial Sediments	Biscayne Aquifer		Lower Clastics of Tamiami
2			Gray Limestone		
3			Gray Limestone Confining Unit	Gray Limestone	
4			Biscayne Aquifer	Gray Limestone Confining Unit	Gray Limestone
5			Biscayne Aquifer		Gray Limestone

Note that the first layer is designated as “overland flow.” This indicates that this layer has extremely high conductivity values assigned in order to mimic open water flow. Layer two is specified as “surficial sediments.”

Rainfall, Recharge and Evapotranspiration

The rainfall inputs were obtained directly from the South Florida Water Management Model (SFWMM) input data sets (South Florida Water Management District and the Interagency Modeling Center, 2005). The maximum evapotranspiration (ET) rates were based on historical records measured at various locations throughout the model domain. Other ET parameters were based on vegetation and land use. This was done in order to have rainfall and evapotranspiration that are not uniformly distributed and more accurately represents the patterns found in nature. Since the SFWMM resolution is 2 miles and, in general, the MODBRANCH resolution is much smaller, the values of rainfall do not have the finest resolution possible for the MODBRANCH grid. However, the SFWMM was the only source of these data available for the years under study. Rainfall is input as recharge directly into the model. Based on assigned extinction depths (depth below ground at which no evapo-transpiration occurs), rainfall and maximum evapotranspiration (ET), net water flow into or out of the model is calculated. This water provides one of the driving forces in the model.

This study required the simulation of three years that represented wet (1995), dry (1989) and average (1978) conditions. The wet year has an event that approximates a 1-in-10 year storm event.

The application of both the rainfall and the ET can dramatically affect the ground water head fluctuations on both a day to day and long term basis. The values and approach used in this study were the best available at the time. The actual areal variation over time of both ET and rainfall is not known and the amount of error induced by this lack of information is not known.

Water Sources and Sinks

Important aspects of any model are the various boundary conditions. The same boundary condition data was used for the simulation of both scenarios for this project. The boundaries represent sources or sinks for groundwater and surface water. Various types of boundary conditions can be simulated utilizing MODBRANCH. For the purposes of this study variable head boundaries were utilized along the northern edge of the model boundary, while the eastern, western and southern boundaries utilized values representing the daily mean tide elevation. The data utilized to assign the boundaries on the northern model edges were imported from the SFWMM model simulation of the IOP ALT7R recommended plan (the most recent simulation of ALT7R, titled "ALT7R5" used version 5.4 of the SFWMM) and interpolated to the smaller MODBRANCH model grid resolution. The variable tidal heads assigned along the coastal side of the model were defined at a constant 0.5 feet. Additional boundary inputs include the flow and stage in various canals (discussed below) and the location of municipal water wells. Further information of the development of various boundaries for the model is available in the MODBRANCH model calibration report (Evans, 2007).

Model Limitations

All numerical model studies have limitations. Many of these are related to the specific computer code chosen for a particular study. Other limitations are related to the field data that is available or lack thereof. Lastly, model studies are also limited by the schedule dictated by project requirements. All of these limitations impart various sources of error or limit the evaluation to an appropriate level of detail. This model study does have limitations and should be used with caution.

A brief discussion of the limitations of this model study is included in the following paragraphs.

Rainfall boundary conditions

Rainfall is an important parameter, especially in the region of south Florida. The amount and timing of rainfall greatly affects the increase or decrease in stage (ground water and canal) and flows within the system. The rainfall boundary conditions used for this study were the same that are used as inputs for the SFWMM, as mentioned above. The spatial resolution of the data is 2 miles x 2 miles and the temporal resolution is 1 day. The MODBRANCH model would give much better results if finer resolution rainfall information were available. The fine data resolution is especially important for simulating ground water stages. Unfortunately, these data are not presently available. Future studies could include rainfall derived from NEXRAD or other methods, which would provide finer resolution temporal and spatial rainfall data inputs.

Evapotranspiration boundary conditions

The total yearly evapotranspiration can equal or exceed the total rainfall for average and dry years, which means that evapotranspiration is an equally important boundary condition.

Variable head boundary conditions

The variable head boundaries, as mentioned above, were generated as a hybrid of SFWMM output and tide data. Future model accuracy could be improved by using more observation wells and eliminating the inherent error found in using model output and harmonic tide data as boundary conditions.

Geologic parameters

South Florida's geology is extremely heterogeneous. Measurements and tests performed at one location can give distinctly different values when done 500 feet away. It is important to keep this in mind when considering the model results. The model considers the hydrogeologic parameters to be homogenous within each grid cell. While hydraulic conductivity and transmissivity vary from cell to cell, each is isotropic (uniform in all directions) within the cell. Additionally, the parameters do not vary significantly between adjacent cells, increasing the degree of homogeneity of the model. The real world is not homogenous. There are indications that there are preferential flow paths within the surficial aquifer including voids, fractures and cavities. These preferential flow paths are not represented by the model inputs.

Canal leakance and hydraulic parameters

The canal leakance and other hydraulic parameters, which affect canal stage and flow, include Manning's roughness ("n" value) and momentum coefficient. Nominal values of each were used throughout the study and are described in more detail in the MODBRANCH model calibration report (Evans, 2007).

Structure operations and implementation

The affect of how the structures are operated and how they are numerically implemented is discussed above. Future refinement of structure operation routines, especially in opening and closing could result in improved replication of field stages and flows.

Topography

The topography used (as stated above) is a composite derived from a variety of data sources. The accuracy of these data (0.5 to 4.0 feet) can significantly affect both the results of the MODBRANCH model and the interpretation of the results. The model results can be affected by slight variations in elevations, since this would change the local land slope. A small change in topography could cause a significant change in flow direction due to the small magnitude water gradients found in the area.

Description of Scenarios

Two scenarios were examined with the MODBRANCH modeling tool for this analysis. The first scenario is the existing condition under the Interim Operational Plan (IOP) operations, referred to as Alt7R; ALT7R was the recommended alternative in the 2002 IOP Final EIS and 2006 IOP Final Supplemental EIS. The second scenario is identical to Alt7R with the addition of the 8.5SMA Plan 6D (figure 6) and with S-357 and S-331 operations modified as specified in proposed operating criteria. Figure 7 shows the 8.5SMA Plan 6D features in detail. The Alt7R + 8.5SMA Plan 6D model simulation is hereafter referred to as the 8.5SMA WCP ("Water Control Plan").

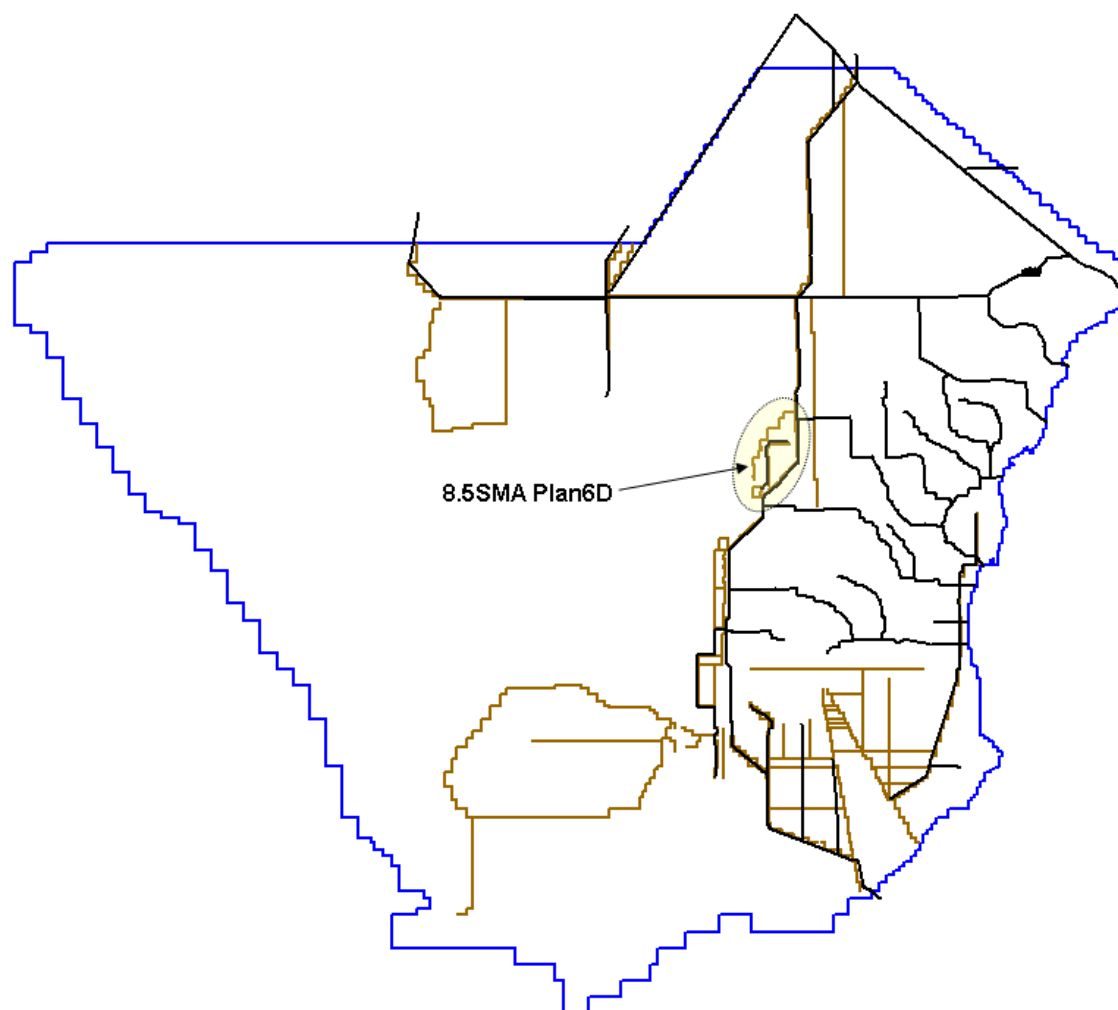


Figure 6: MODBRANCH Simulation Configuration with 8.5SMA Plan 6D

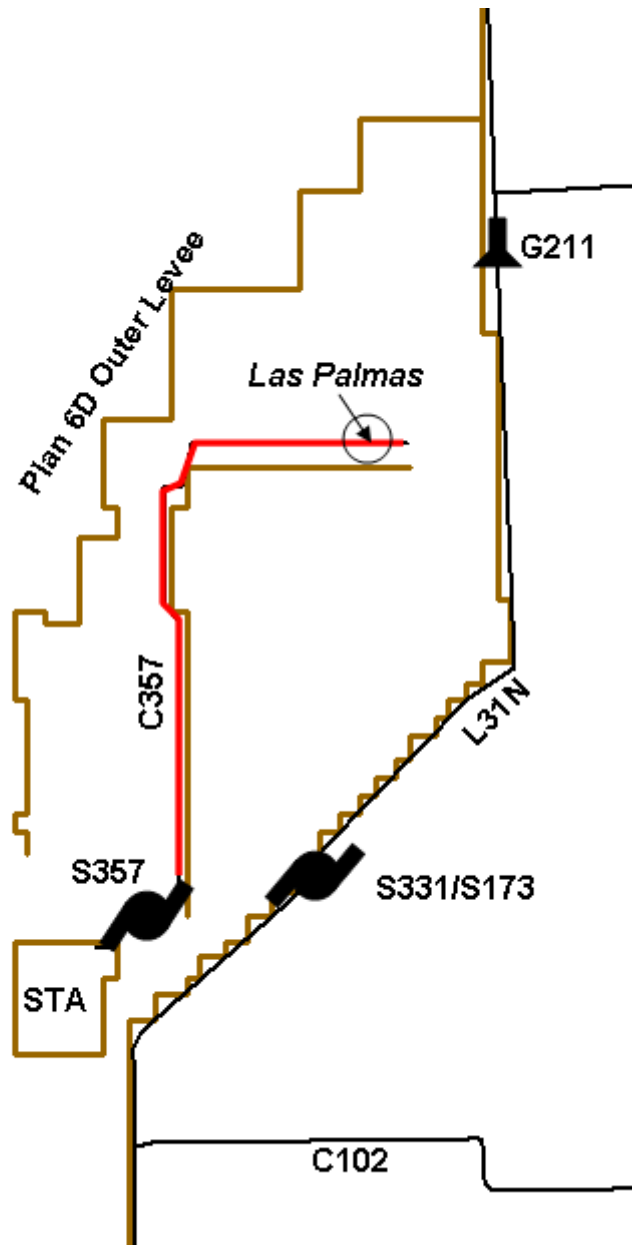


Figure 7: Detail of 8.5SMA Plan 6D

Operations

The Alt7R simulation operated all the structures under the Interim Operational Plan. The 8.5SMA WCP simulation operated all project area structures using the same operational rules as the Alt7R simulation with the exception of the S331 and S357 pump stations. At the time of modeling, the S-357 was specified to pump up to the structure design capacity of 575 cfs.

S-331 will no longer reference Angels Well but will trigger from a gage in the northern part of seepage collection canal named Las Palmas (see [figure 7](#)).

The following is the language from the proposed operating criteria:

7-05.1.1 S-357 and 8.5 SMA STA

Pump Station S-357 will operate during high water levels. The pump station will “trigger” (or turn on/off) based on water levels in a stilling well (Las Palmas) located in the new seepage canal approximately 3,500 feet west of L-31N (about 1,000 feet from the seepage canal northern terminus). Two different criteria's will be set for this pump station based on time of year:

7-05.1.1.1 Wet Criteria (Defined as when G-3273 is above 6.8 ft) The S-357 pump station will turn on when the stilling well (Las Palmas) water level reaches elevation 5.2 feet. The pump will turn off when the stilling well water level is lower than elevation 4.9 feet. The pump station will pump as required to maintain this upstream canal stage and prevent surface water discharge from the STA. The pumping discharge rate will be reduced or shutdown completely to prevent an overflow event during Phase 1 operations.

7-05.1.1.2 Dry Season (Defined as when G-3273 is below 6.8 ft) The S-357 pump station will turn on when the stilling well water (Las Palmas) level reaches elevation 5.7 feet. The pump will turn off when the stilling well water level is lower than elevation 5.4 feet. The pump station will pump as required to maintain this upstream canal stage and prevent surface water discharge from the STA. The pumping discharge rate will be reduced or shutdown completely to prevent an overflow event during Phase 1 operations. Once an elevation of 10.0 feet in the STA is reached, pumping of S 357 will be constrained to 125 cfs.

7-05.1.2 S-331

The S-331 Pump station has three diesel driven pumps capable of pumping a total of 1160 cfs (387 cfs each). S 331 has three general operational rules:

7-05.1.2.1 8.5 SMA Seepage Canal Criteria - Las Palmas Criteria (replaces Angels Well) The stage measured at Angel’s well, located west of the 8.5 SMA protection levee, will no longer be used to determine the appropriate operating criteria for S-331. Discharges through S-331 can be made if the S-331 Tailwater (TW) stage is below elevation 6.0 feet and the S-176 Headwater (HW) stage is below 5.5 feet, NGVD. If either of these water levels, downstream of S-331, is exceeded, discharges at S-331 will be terminated until the S-176 HW stage recedes to elevation 5.0 feet and the S-331 TW is at or below elevation 6.0 feet. If heavy rainfall is forecasted S-331 discharges will be terminated when the S-176 HW stage is between elevations 5.0 feet and 5.5 feet. The following text describes the operations

of S-331 as defined by the stilling well located in the 8.5 SMA Seepage Canal (same well used for S-357 operations):

(a) If the stage at the 8.5 SMA Seepage Canal well is less than elevation 5.5 feet there will be complete flexibility in operating the L-31N Borrow Canal system within the design limits specified by the Corps. Operations include the ability to convey water from S-334 (excess water from WCA-3A or WCA 3B), S 335 with S-337 closed (excess water from the L-30 Canal), excess water from the L-31N between S-335 and G-211 (S-336 closed or discharging east), or a combination of these sources for low pumping rate (125 cfs or less per pump stations) operations of S 332B, S-332C, and S-332D. Low pumping rate operations can be initiated below the flood control operation levels.

(b) If the stage at the 8.5 SMA Seepage Canal well is between elevations 5.5 and 6.0 feet the average daily water level upstream of S-331 will be maintained between elevations 4.5 feet and 5.0 feet if permitted by downstream conditions.

(c) If the stage at the 8.5 SMA Seepage Canal well is above elevation 6.0 feet the average daily water level upstream of S-331 will be maintained between elevations 4.0 feet and 4.5 feet until the water level at the 8.5 SMA Seepage Canal well recedes below 5.7 feet if permitted by downstream conditions.

7-05.1.2.2 Flood Control

When the headwater stage at S-331 is higher than elevation 5.3 feet, use one pump (387 cfs) or S-173 with or without siphons to maintain stage. Once stage recedes below elevation 5.1 feet, cease discharges. Increase pumping to two pumps when headwater is greater than elevation 6.0 feet. Once stage recedes below elevation 5.5 feet, turn off second pump. Increase pumping to three pumps when headwater is greater than elevation 6.5 feet. Once stage recedes below 6.0 feet, turn off third pump.

7-05.1.2.3 Water Supply (No Changes from Alt7R).

Impacts of 8.5SMA proposed operating criteria on landowners within the 8.5 SMA

The authorized Plan 6D was never modeled for the 8.5 SMA GRR (2000). There were approximations of the Plan 6D, but the final authorized canal and levee alignment differed in some areas. This was done in order to minimize the impact on landowners, avoid damage to wetlands, and to reduce the costs. The details of the authorized plan were too fine to accurately simulate using the “South Dade” MODBRANCH grid used in the 8.5 SMA study (2000).

The C-111SC study used the MODBRANCH MB_2006 grid with finer resolution in the 8.5 SMA (and elsewhere). Therefore, the authorized Plan 6D can more accurately be simulated with this model.

The 1995 rainfall record had a rainfall event that approximates a 10-year rainfall event (1 in 10 year return period) over a 5 day period (figure 8). The impact of this event was used to evaluate potential effects to the existing level of service within the 8.5SMA. It should be noted that the original 8.5 SMA study (2000) did not use synthetic storm events to estimate flooding impacts; it used the same 1 in 10 year rainfall event described here and used for this project.

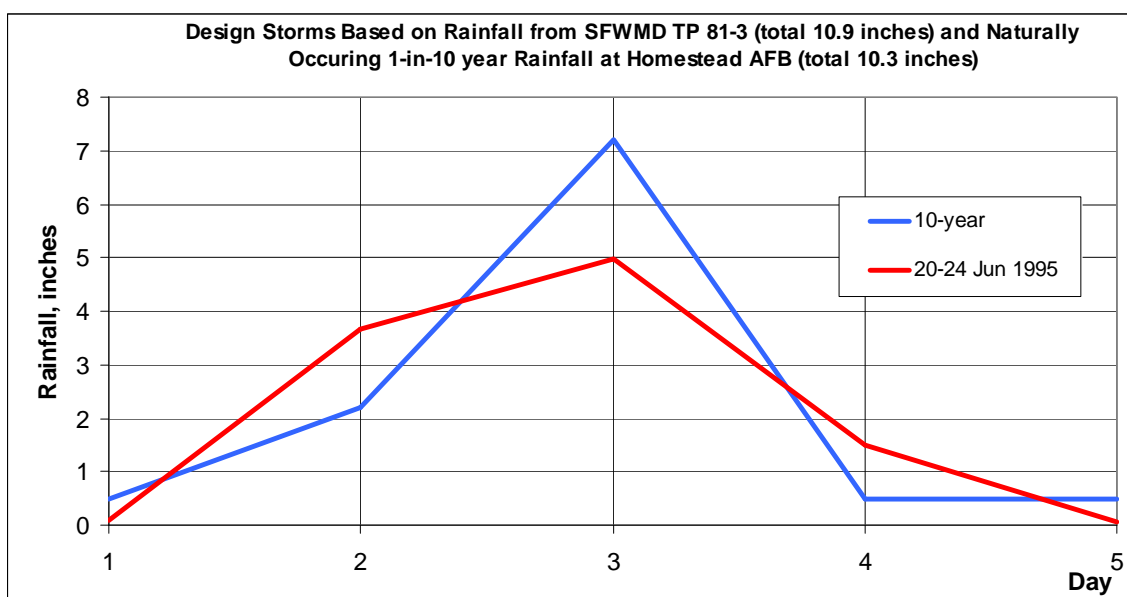


Figure 8: Comparison of Synthetic 10 year rainfall event with the 20-24 June 1995 event

Figure 9 shows the peak depths that occur during the period June-July 1995. The solid black line shows the 0 ft depth line for the Alt7R (i.e. “existing”) condition simulation. This condition does not include the outer/inner levees, the seepage canal, or the S357 pump station. The color contours show the variations in depth between 0 and 3 feet for the 8.5SMA WCP condition simulation. It is apparent from this figure that the level of service provided under Alt7R is not exceeded under the 8.5SMA WCP simulation.

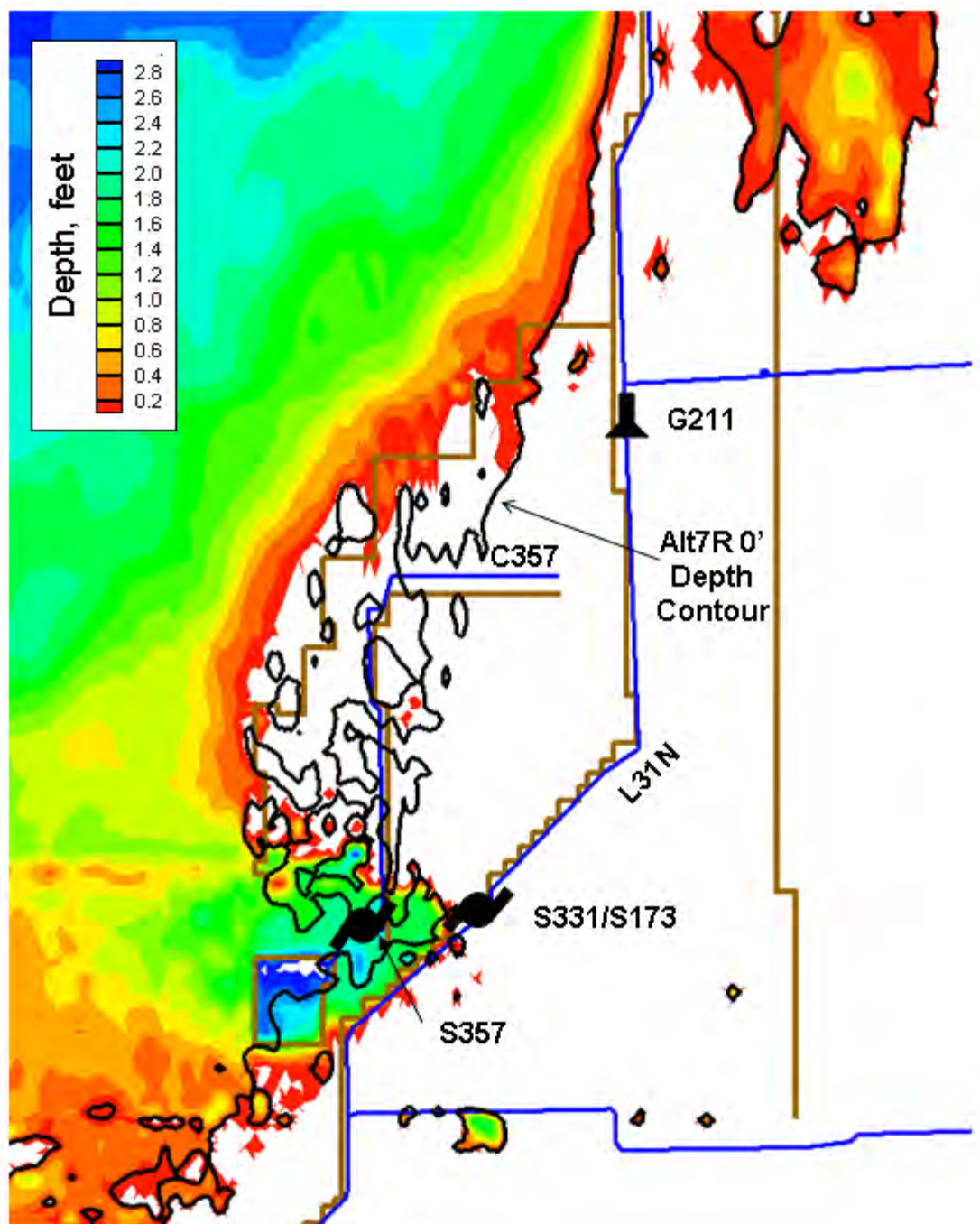


Figure 9: Peak Depth for 8.5SMA WCP (color contours) and the Alt7R (black line), July 1995.
The Alt7R solid line represents the 0 depth contour

The amount of acreage that is affected by the high water was summarized for each of the regions within the 8.5 SMA. [Figure 10](#) shows the 8.5 SMA regions at the scale of the MODBRANCH model. The areas of interest are “East of the

canal", "West of the canal", "North of the canal", the canal, and the "flowage easement" area. Land within the flowage easement area can be flooded.

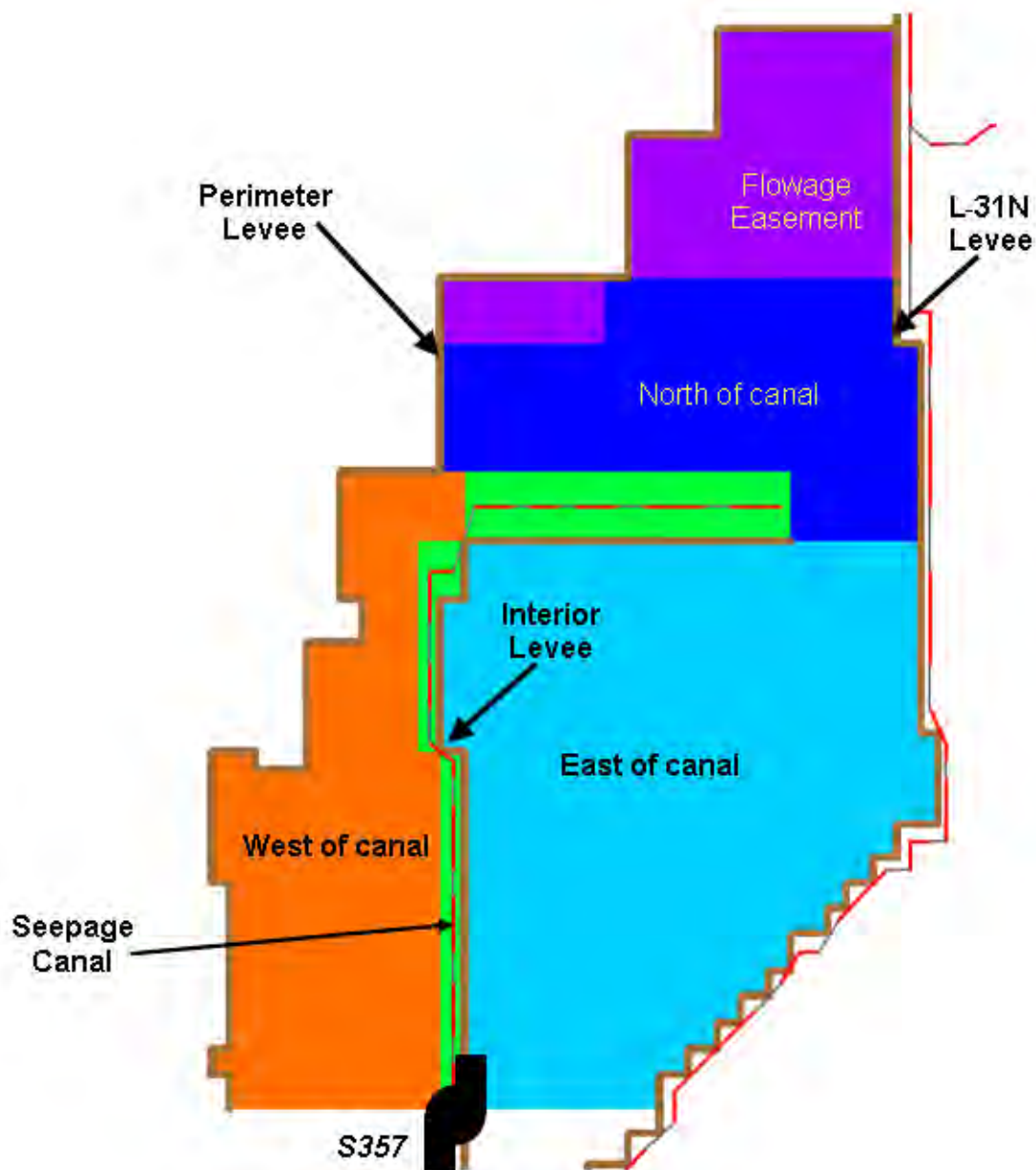


Figure 10: Sub-areas of the 8.5SMA "Plan 6D"

Figures 11-16 show the total number of acres where the peak stage is at a specified depth (0.1 foot intervals are selected) for each sub-area and for the total area within the outer levee and not within the flowage easement (figure 16). The trend for each area is less acreage with peak depths > 0 feet (above

modeled ground surface elevation) for the 8.5SMA WCP condition simulation, compared to the Alt7R condition simulation. All but “West of the Seepage Canal” (figure 12) indicate a decrease in flooded acreage (peak depth > 0 ft) for 8.5SMA WCP over the Alt7R condition. The area west of the seepage canal has about 400 acres with a peak depth greater than 0 feet under Alt7R conditions (this number is determined by adding the acreages identified within each depth interval). Under 8.5SMA WCP conditions, the number of acres is about 150 acres. So, although there are some areas with deeper peak depths, the overall amount of area with water above ground actually decreases. The results clearly indicate that the 8.5SMA WCP simulation satisfies the objective to not reduce the existing level of service within the 8.5 SMA.

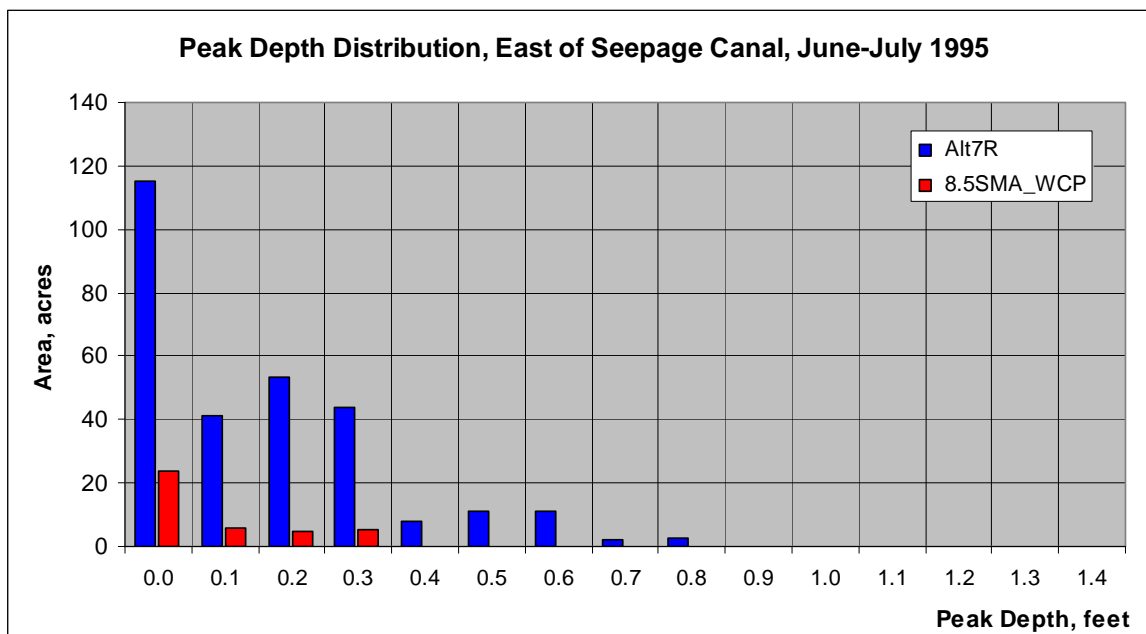


Figure 11: Peak Depth Distribution, East of Seepage Canal

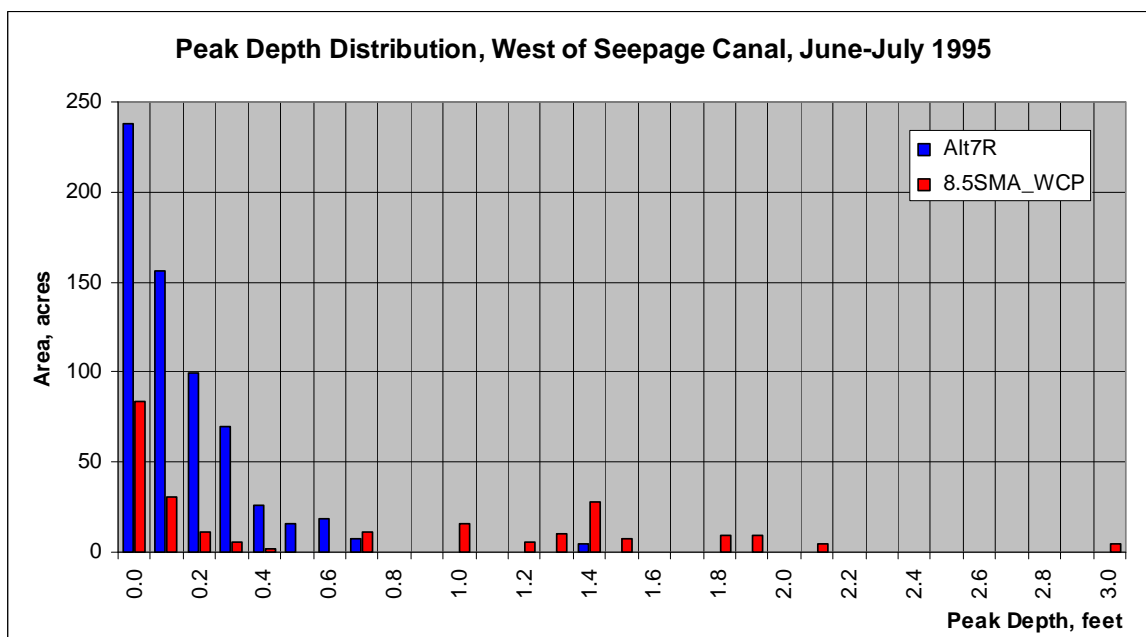


Figure 12: Peak Depth Distribution, West of Seepage Canal

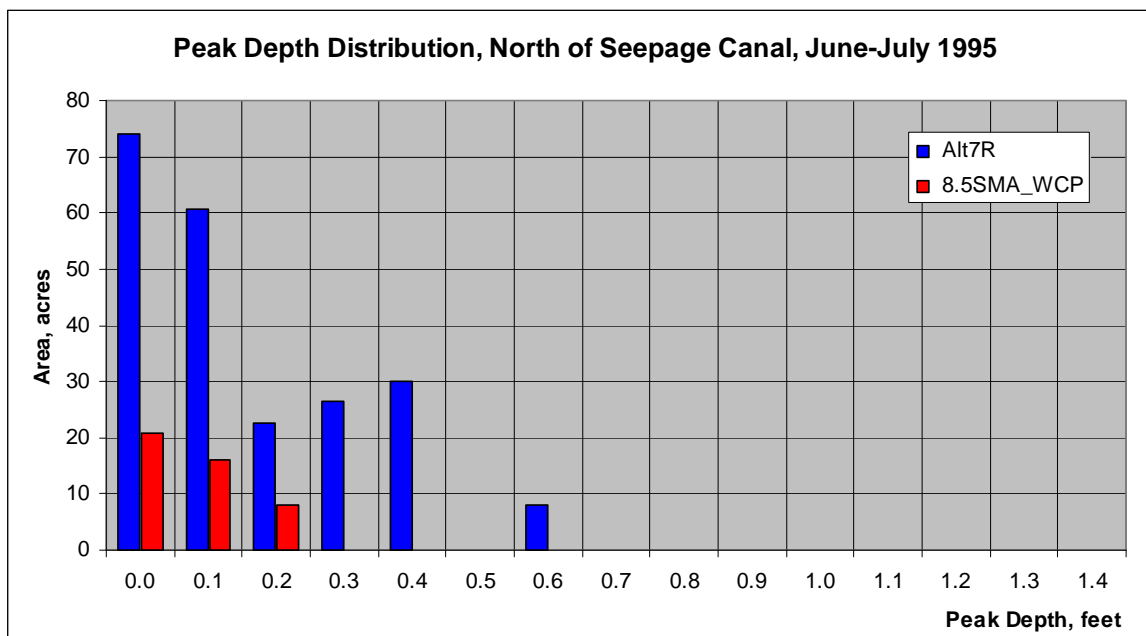


Figure 13: Peak Depth Distribution, North of Seepage Canal

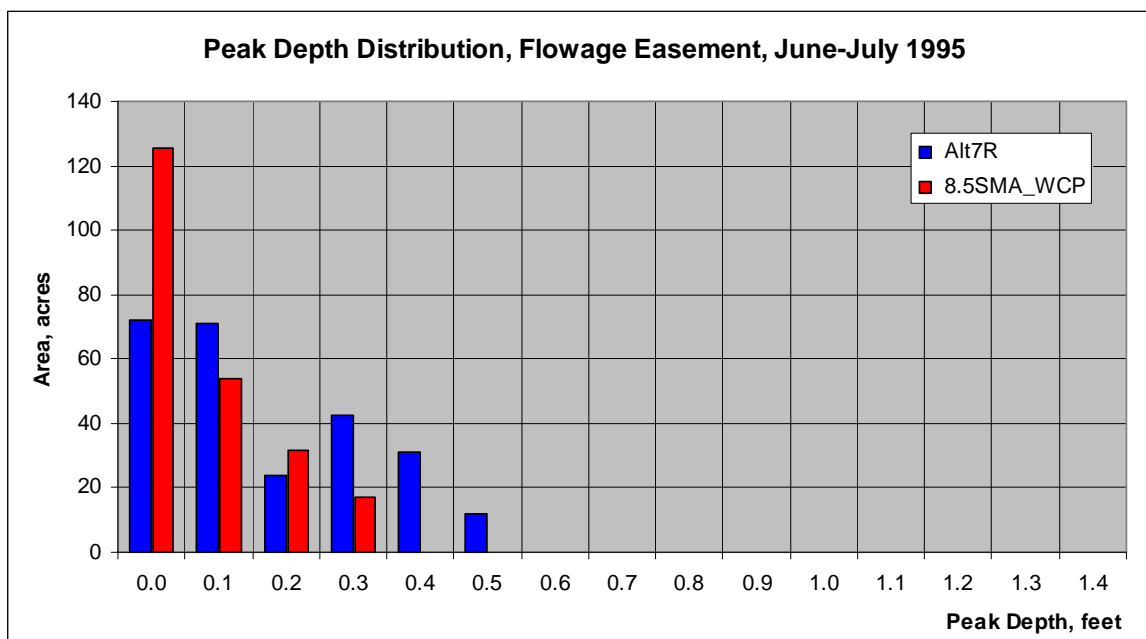


Figure 14: Peak Depth Distribution, Flowage Easement Area

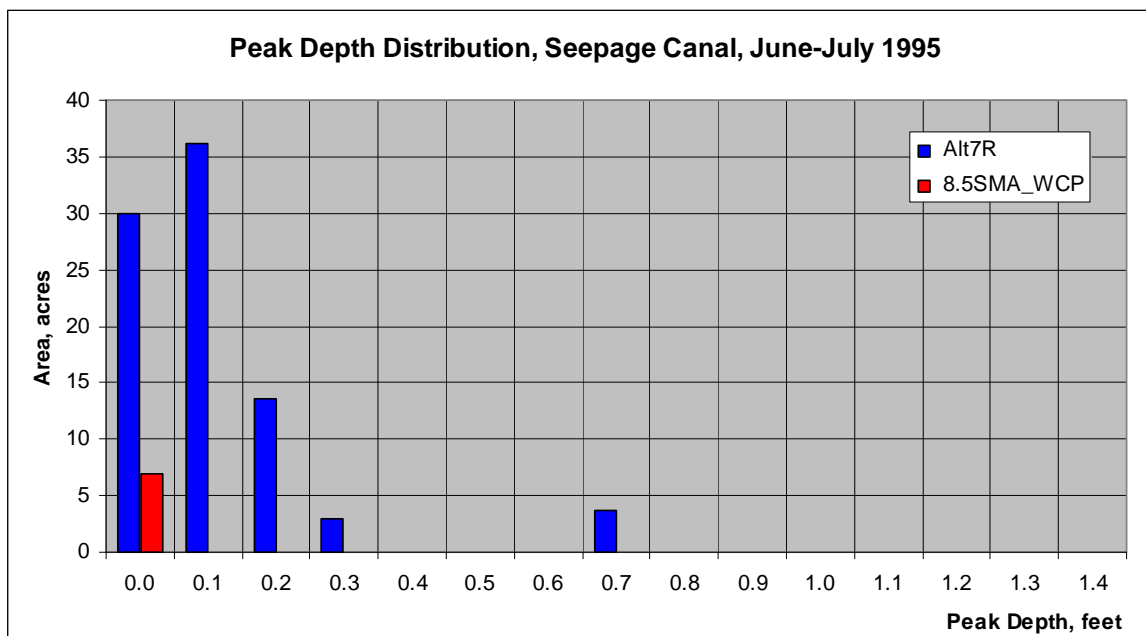


Figure 15: Peak Depth Distribution, Seepage Canal Area

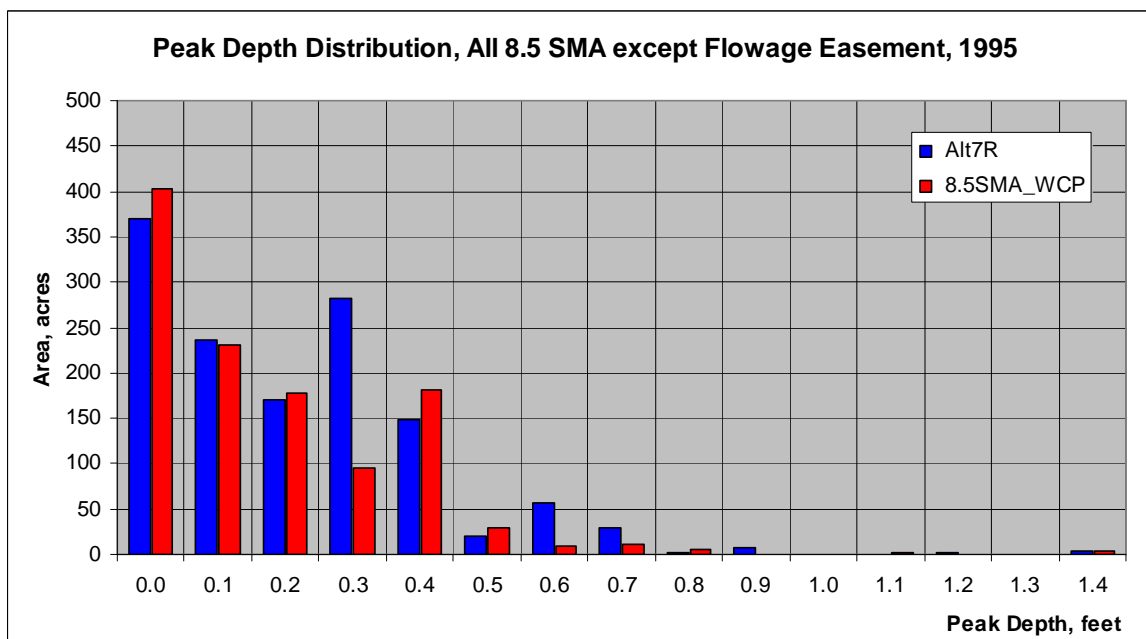


Figure 16: Peak Depth Distribution, All 8.5 SMA within outer Levee, excluding Flowage Easement area

Level of Service of 8.5SMA proposed operating criteria on areas outside the 8.5SMA

Figure 17 shows the difference between peak stage values for the wet year, 1995. The largest differences east of L31N are along the reach of L31N between G-211 and S-331 and range up to about 1.4 feet. Noting that the peak water level is still approximately 1 to 2 feet *below* the simulated ground surface elevation in this region, no significant adverse impacts are expected.

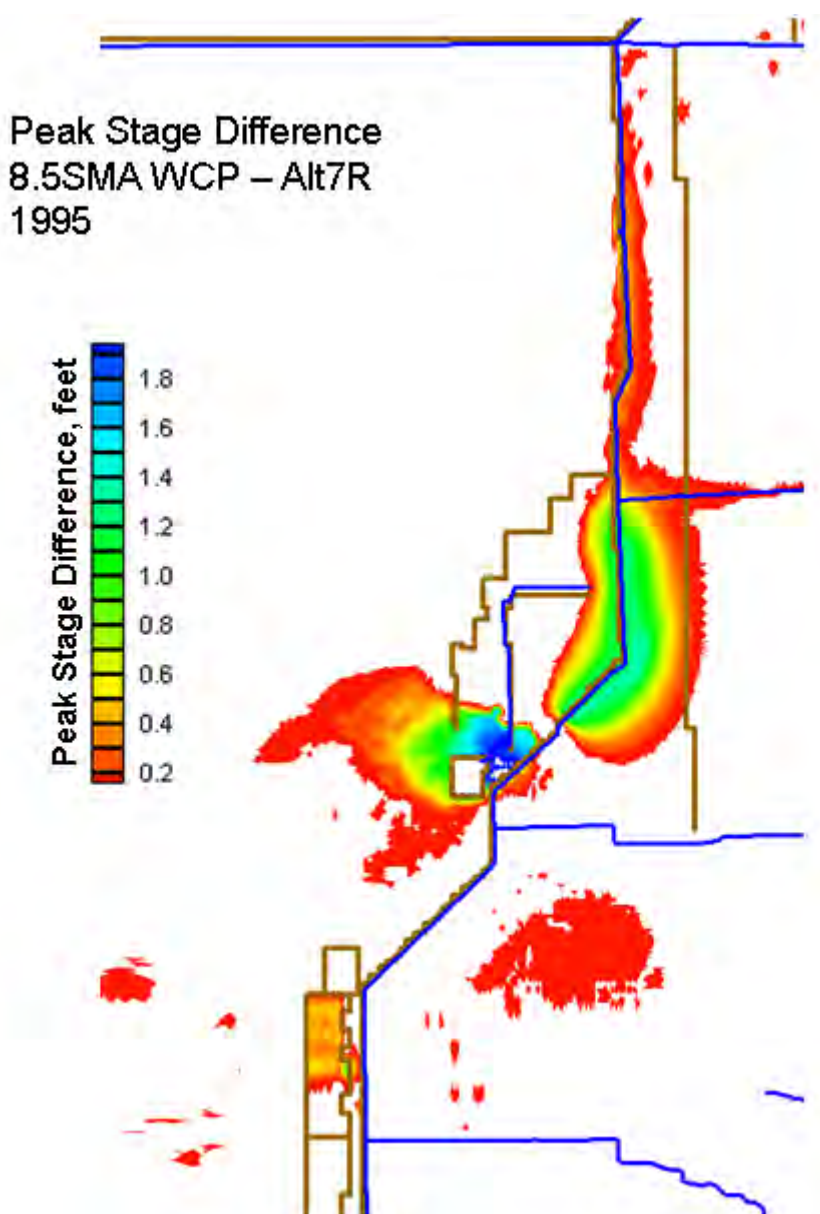


Figure 17: Peak Stage Difference between 8.5SMA WCP and Alt7R, 1995

Environmental Effects of 8.5SMA Proposed Operating Criteria

A full examination of the environmental impacts of the 8.5SMA WCP condition simulation is beyond the scope of this modeling documentation report and will be provided with the Environmental Assessment Report for this project. The purpose of the S357 and S331 operations under the proposed operating criteria is to prevent an increase in potential flood damages in the 8.5SMA while targeting to provide localized environmental benefits by shifting the S331 pump station trigger from Angel's Well (outside of the 8.5 SMA perimeter levee) to the Las Palmas gage within the 8.5 SMA seepage canal. A review of changes in hydroperiods (the simplest environmental measurement) for the average, dry, and wet years simulated with the MODBRANCH modeling tool for this study is provided to indicate potential environmental effects, including potential areas of environmental benefits, resultant from the proposed operating criteria.

Figures 18-20 show the hydroperiod differences between the 8.5SMA WCP simulation and Alt7R simulation for the average, dry, and wet years, respectively. When using hydroperiods as a measure of impact, the dry year is the most important, followed by the average and then the wet. In each of these figures, the green areas indicate changes of less than +/- 10-15 days. Shades of blue indicate areas where the hydroperiod is increasing from Alt7R to 8.5SMA WCP; shades of yellow and red indicate areas where the hydroperiod is decreasing.

Figure 18 (average year, 1978) indicates that the hydroperiod is generally the same throughout the model domain, with the exception of a slight decrease in the Taylor's Slough headwaters. This could be a result of C357 (the 8.5SMA seepage canal) intercepting water that would normally leak into L31N, flow south, and be available for pumping into the either the C111 detention ponds or into the Frog Pond area by S332D.

Figure 19 (dry year, 1989) appears to show very small changes in the hydroperiods, especially in the area of the project. The maximum changes are less than +/- 20 days. The most significant change is the decrease in hydroperiod (more than 20 days) in the northern part of the C111 detention ponds. This observed effect is due to the 8.5SMA plan either retarding or intercepting water that would normally leak into L31N canal. The small decrease in flow is sufficient to reduce water volume into the detention ponds by decreasing the stage in L31N, which is the trigger for the pumps.

The most dramatic differences are found in the wet year, 1995. In this year, the 8.5SMA WCP condition simulation both increases and decreases hydroperiods by more than 50 days. In addition, the areas with the largest

changes are adjacent to one another ([figure 20](#)). In the areas west and northwest of the C111 detention ponds, the hydroperiods increase more than 50 days. This is a result of the S357 pump pushing water south into the S357 stormwater treatment area (STA), causing a localized increase in stage and forming a small hydrologic ridge. Water flowing from Northeast Shark River Slough is pushed further south, where it then encounters the hydrologic ridge created by the C111 detention ponds. This compounds the effect and creates larger hydroperiods. In addition, the higher water levels help to maintain higher headwater stages (in L31N) for S332B and S332C. The higher stages in the ponds induce more return to the canals. This, in turn, produces higher headwaters stages which cause S332B and S332C to pump more water under the 8.5SMA WCP than under Alt7R conditions. In addition, S331 pumping is greatly reduced under the 8.5SMA WCP (674 kac-ft to 92kac-ft). This reduces the amount of water from upstream that is available to S332D for delivery to the Frog Pond area, thus decreasing hydroperiods in the area west of the Frog Pond. However, S332D is also pumping more water und the 8.5SMA WCP than under Alt7R. The overall effect of a reduction by 86% of flow through S331 and increased pumping ins S332Bw, S332C and S332D induces more leakage into the reach of L31N canal between S331 and S332D. In the vicinity of the detention ponds, this increase in leakage is probably matched by the back flow from the detention ponds. However, south of S332D, there will be less water available. This will cause increased leakage to the lower C-111 and a decrease in hydroperiods to the west.

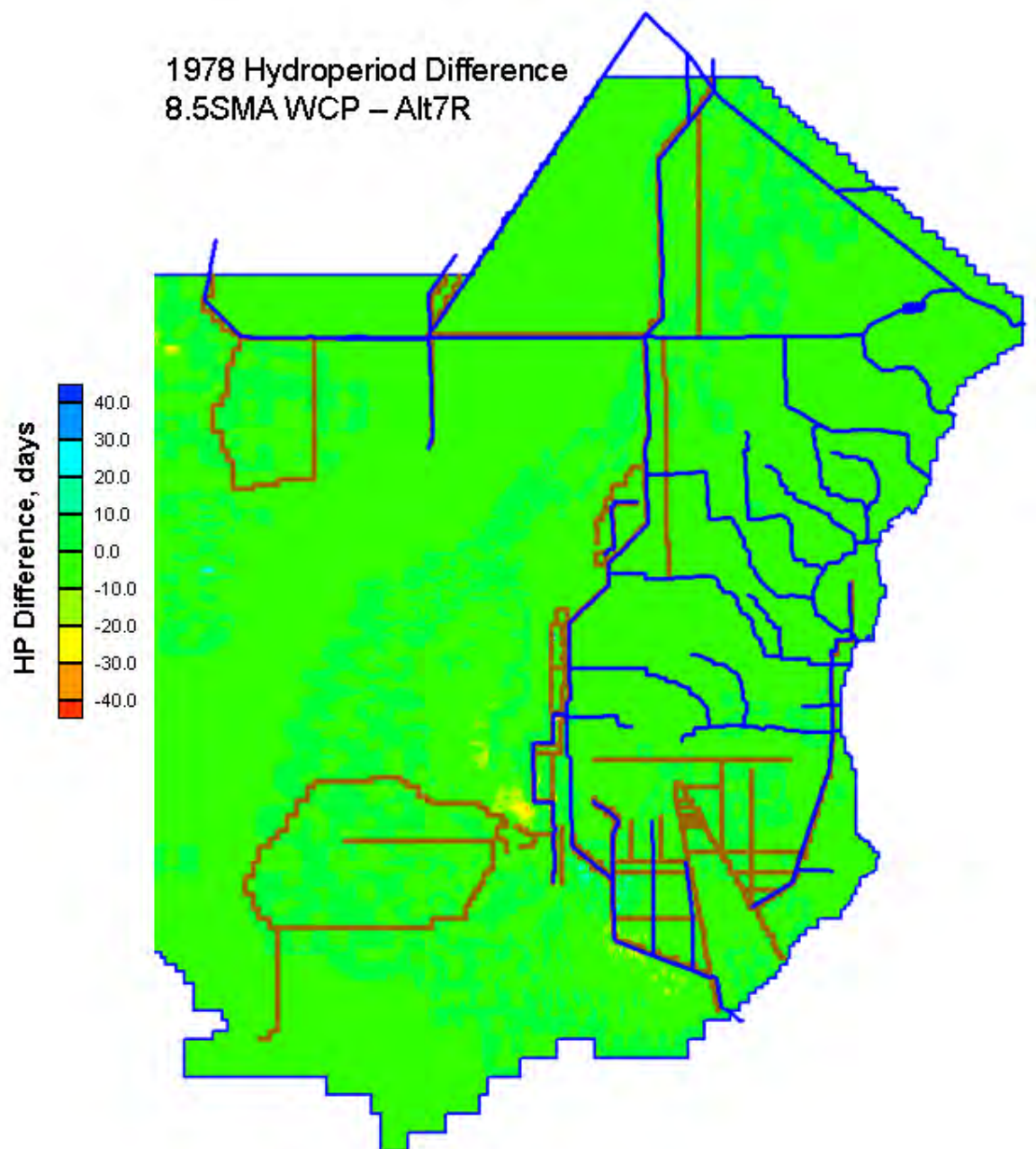


Figure 18: Hydroperiod Differences, 8.5SMA WCP - Alt7R, 1978 (Average Year)

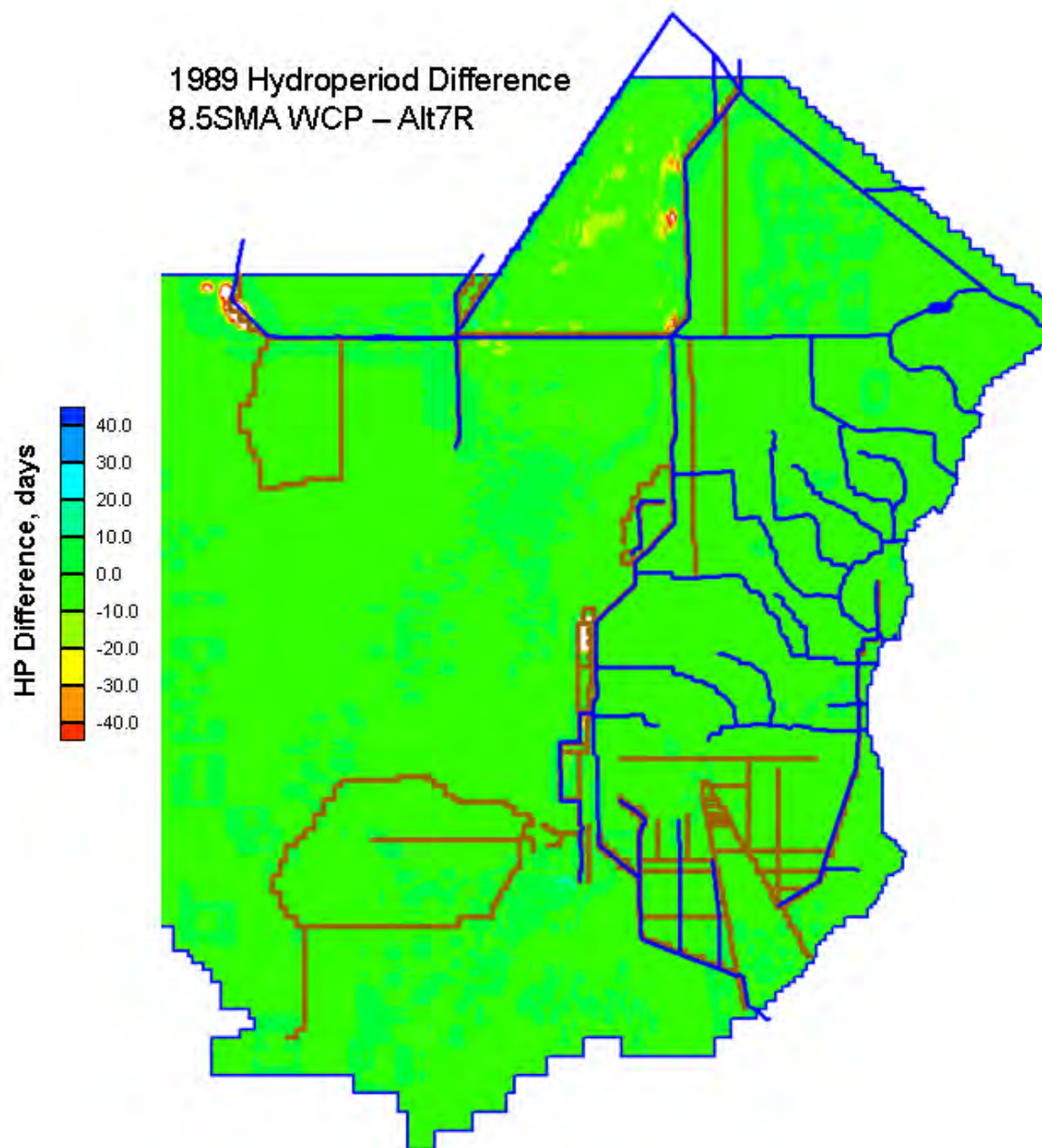


Figure 19: Hydroperiod Differences, 8.5SMA WCP - Alt7R, 1989 (Dry Year)

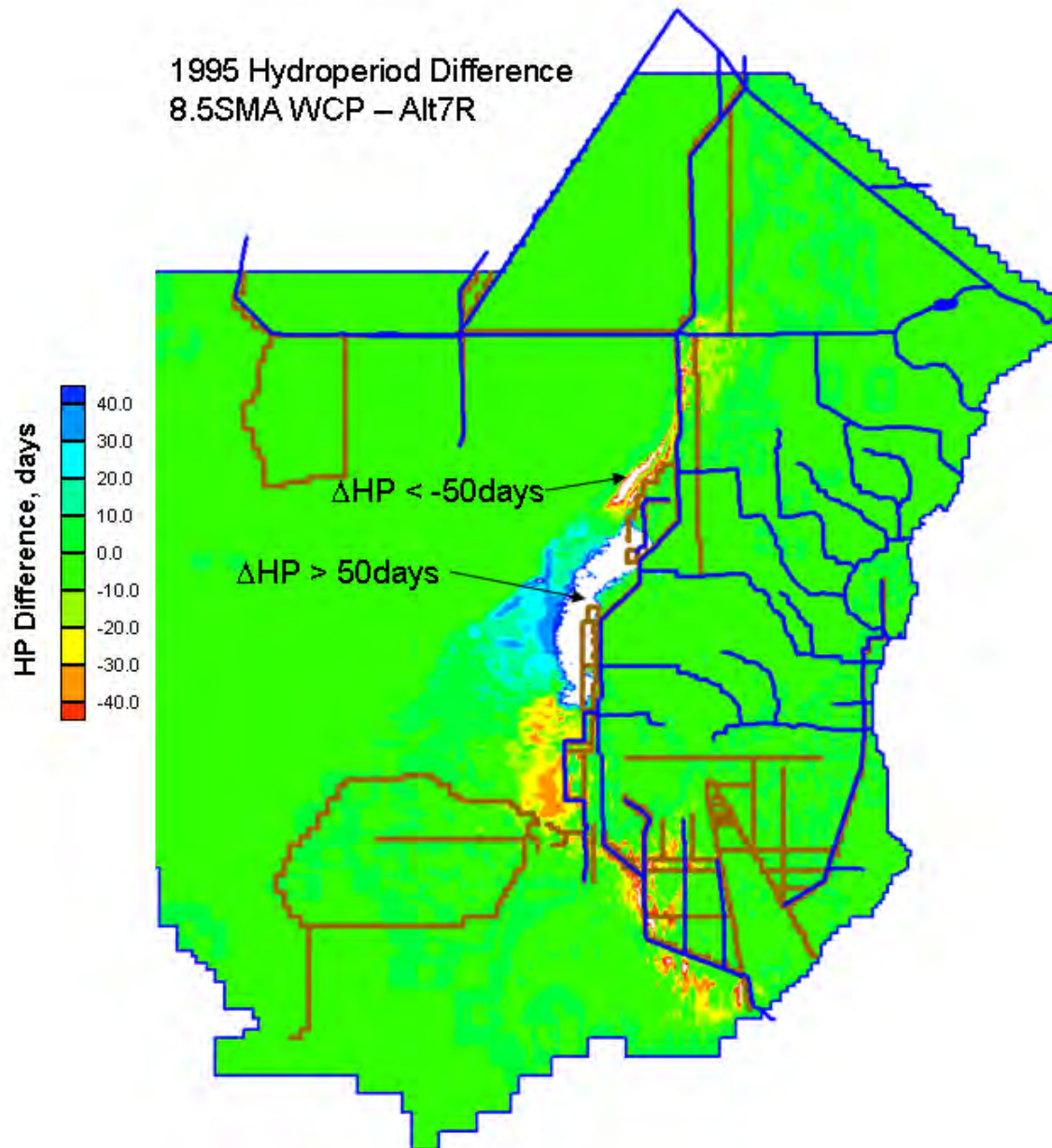


Figure 20: Hydroperiod Differences, 8.5SMA WCP - Alt7R, 1995 (Wet Year)

Potential Impacts on the Cape Sable Seaside Sparrow

There are two CSSS habitat units that may experience impacts due to changes in hydroperiod in a wet year. Figure 21 shows the locations of the CSSS habitat units, as they are presently defined by the USFWS. Note that U5 is immediately west of the C111 detention ponds and U2 is immediately west of the Frog Pond area. The increase in hydroperiods to the west of the C111 detention ponds may be detrimental to the Cape Sable Seaside Sparrow

(CSSS) habitat unit U5, depending on the timing. However, the decrease in hydroperiod west of the Frog Pond may have a beneficial impact on CSSS habitat unit U2.

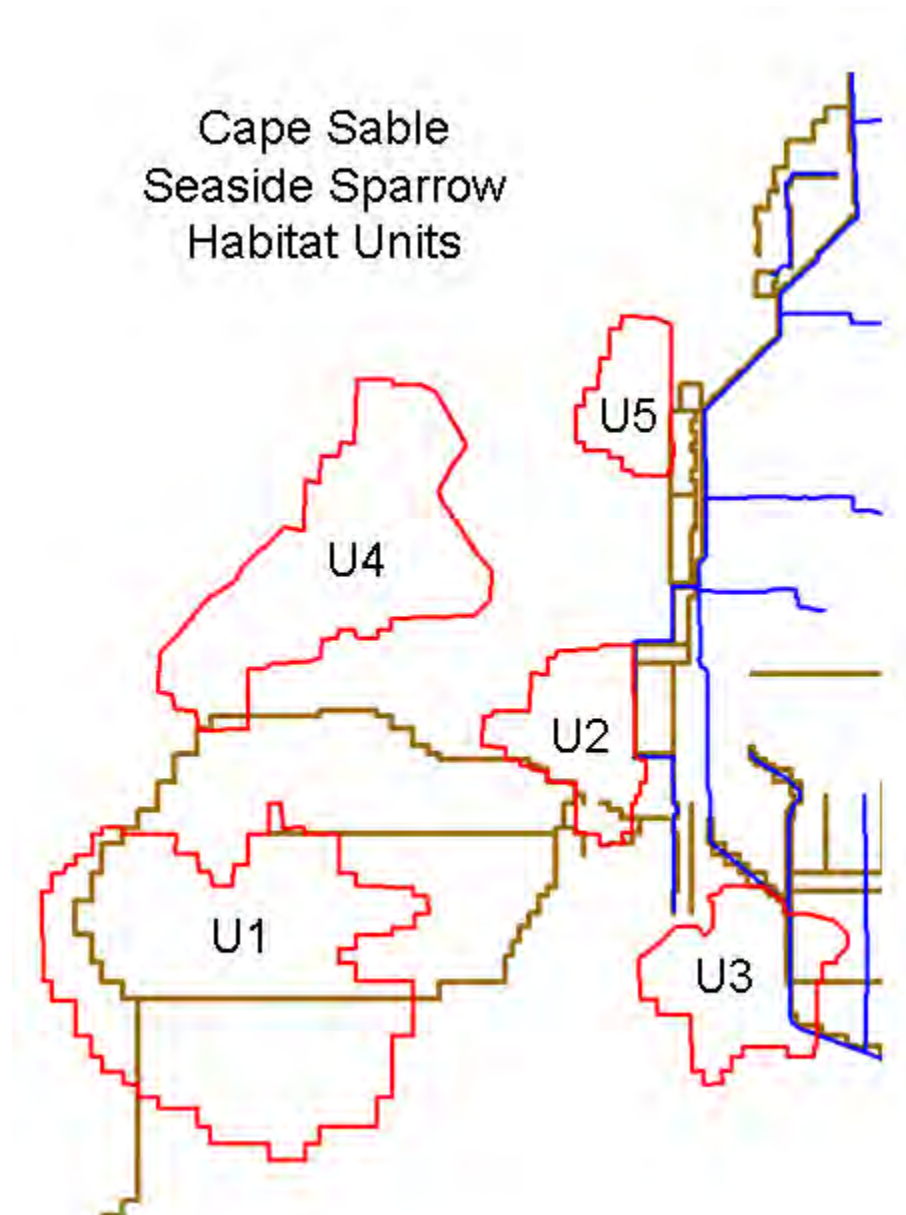


Figure 21: Cape Sable Seaside Sparrow Habitat Units

Figure 22 combines figures 20 and 21 to show the detail of the simulated effects of the 8.5SMA WCP on the CSSS habitats U5 and U2. Also shown are 4 points, two each in U5 and U2. Figures 23-26 show the daily stage values for the two conditions. The blue shaded area indicates the CSSS breeding season (1 March – 15 July). From these figures, it appears that the increase in

hydroperiod occurs outside of the CSSS breeding season. The modeled ground surface elevation for the selected grid cells is indicated with the green horizontal line.

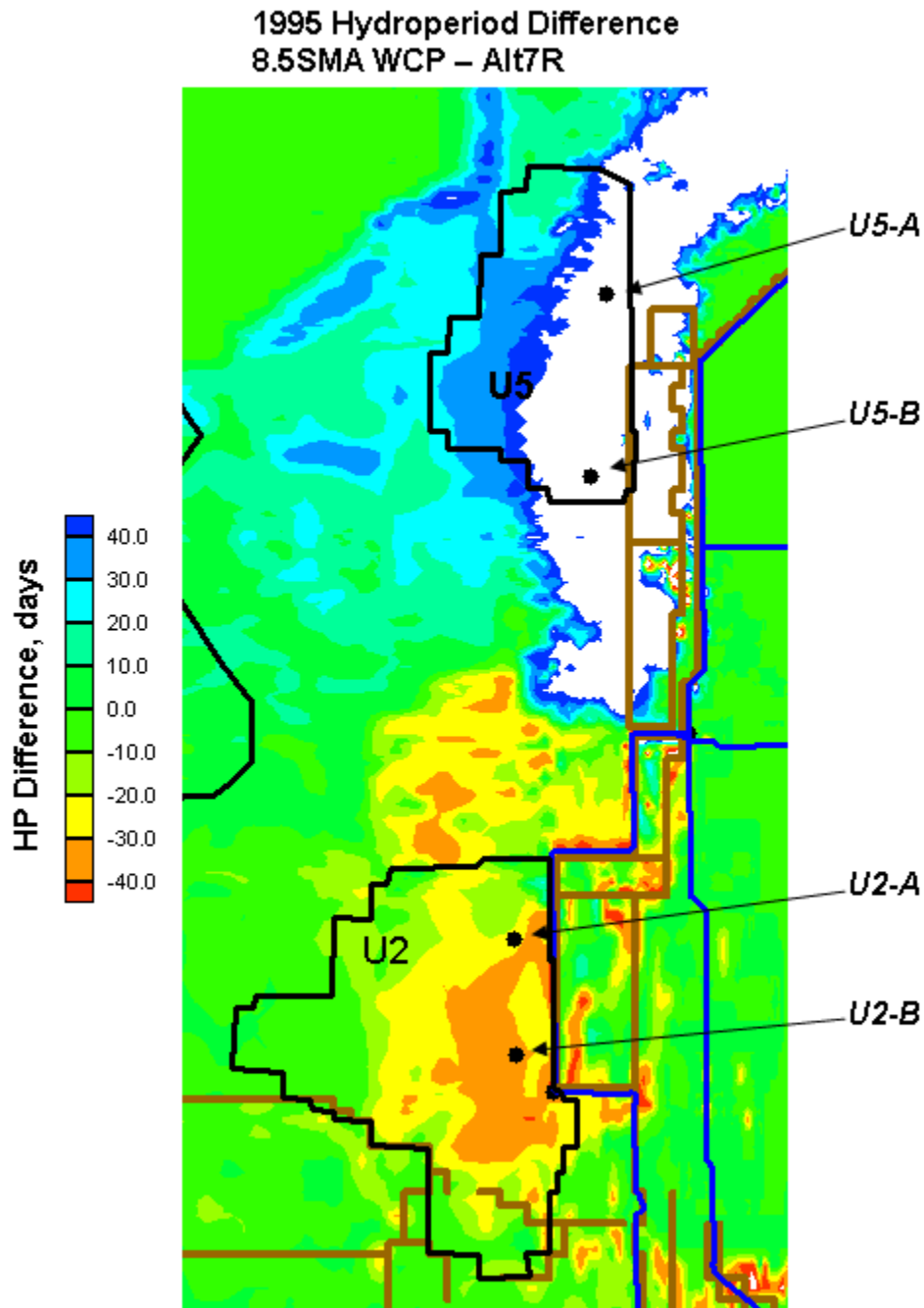


Figure 22: Detail View of 1995 Hydroperiod Differences and the affected CSSS Habitats

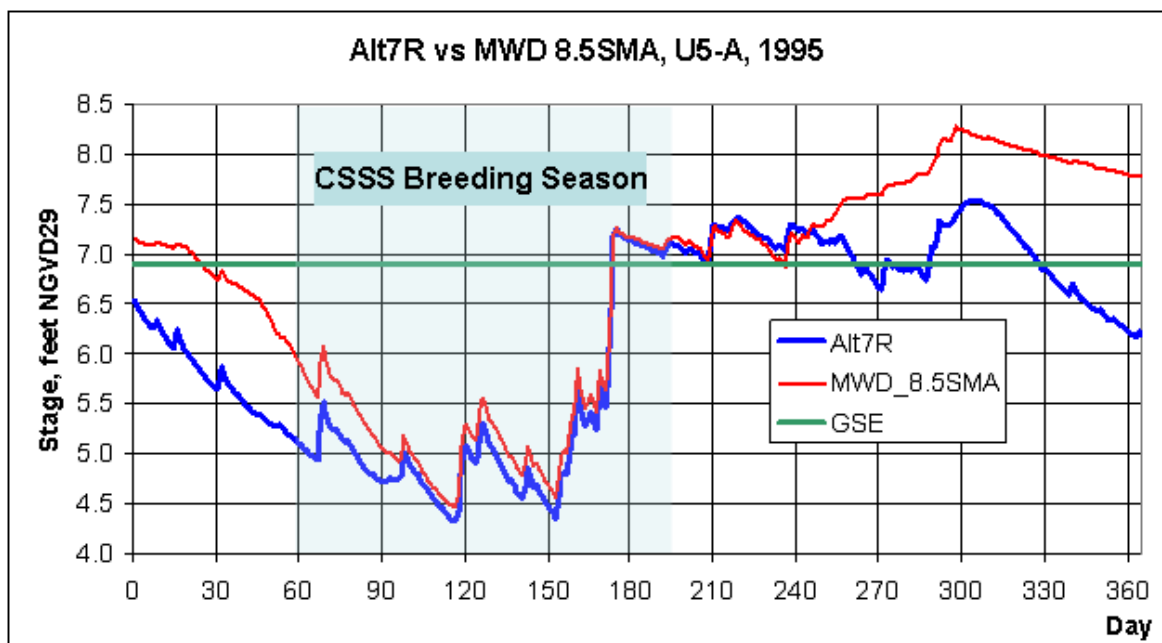


Figure 23: Stage for 1995, Alt7R vs 8.5SMA WCP, Point U5-A

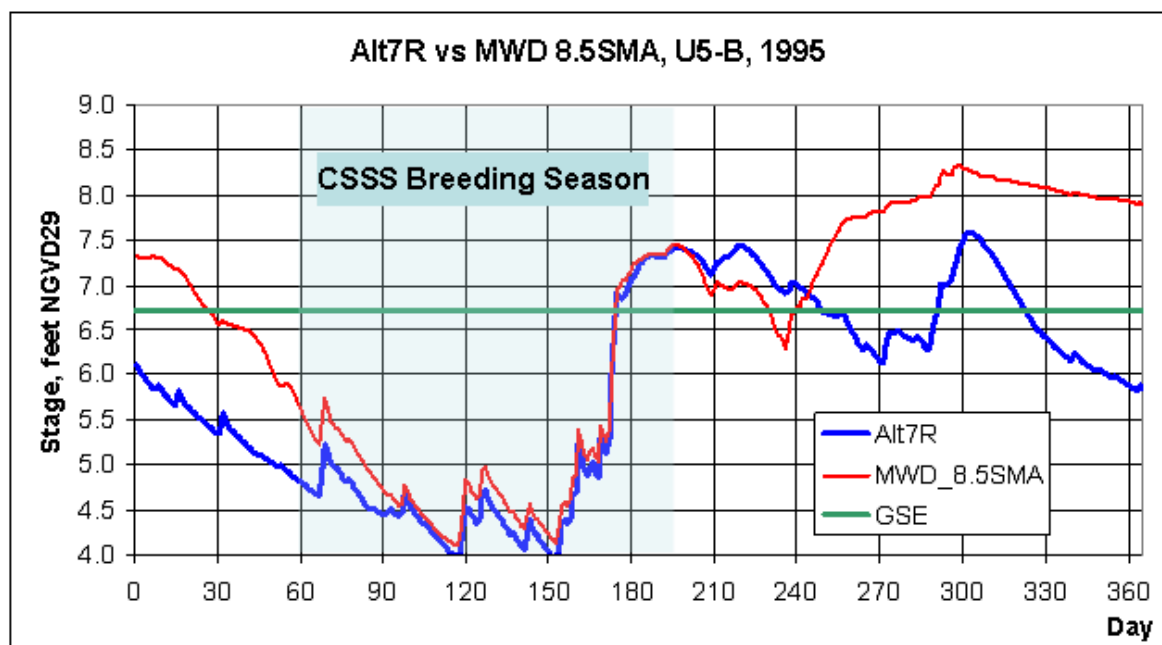


Figure 24: Stage for 1995, Alt7R vs 8.5SMA WCP, Point U5-B

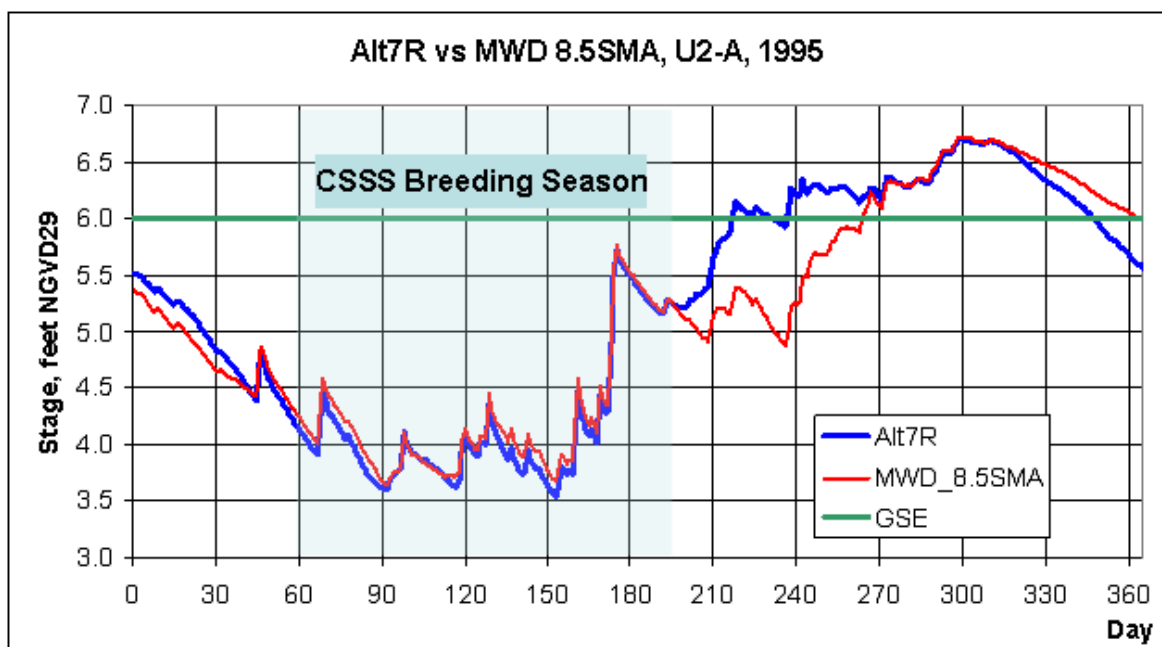


Figure 25: Stage for 1995, Alt7R vs 8.5SMA WCP, Point U2-A

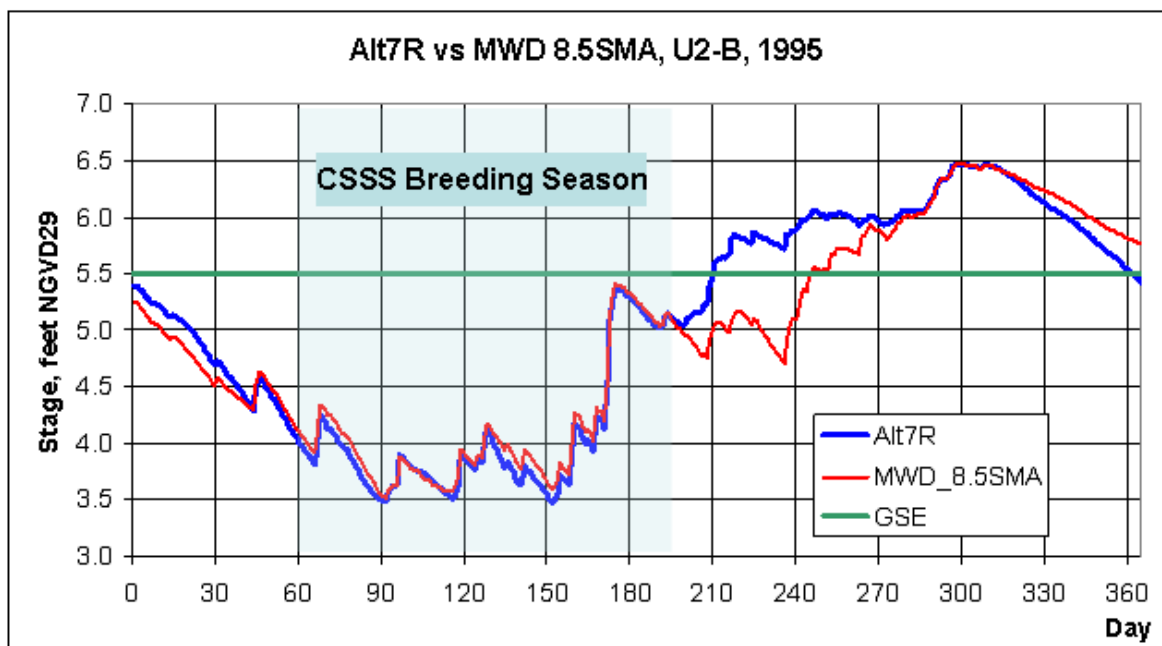


Figure 26: Stage for 1995, Alt7R vs 8.5SMA WCP, Point U2-B

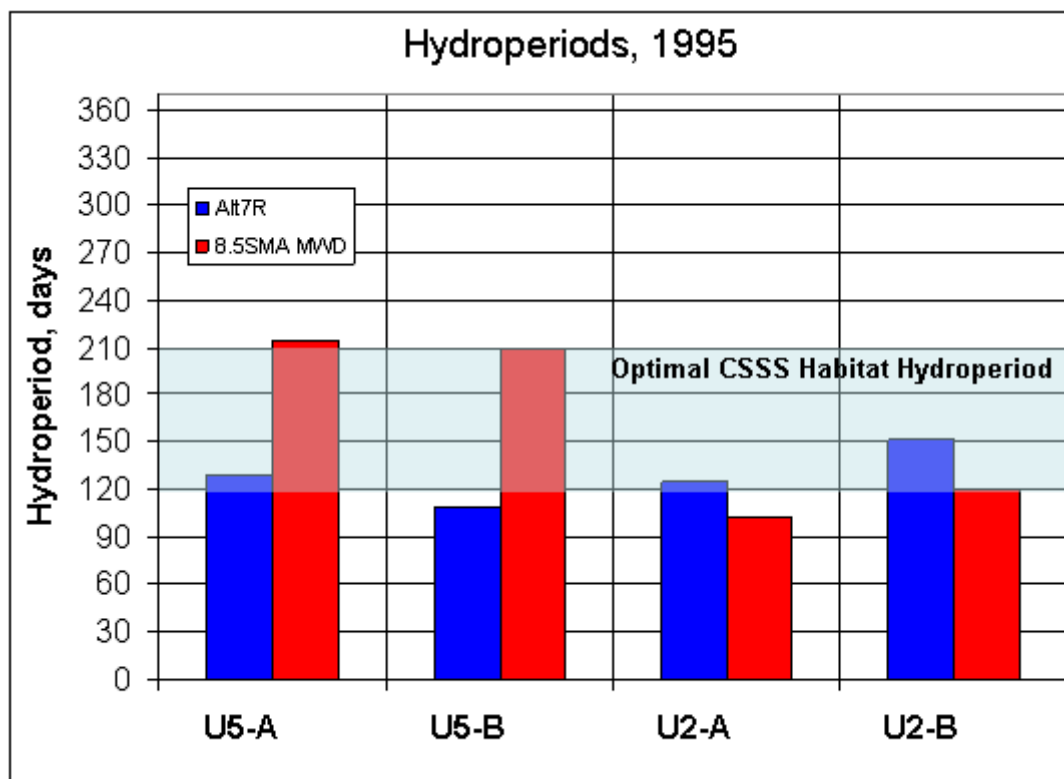


Figure 27: Change in Hydroperiod at specified locations within CSSS Habitats U5 and U2, 1995

The CSSS prefers a limited type of vegetation which, in turn, requires a hydroperiod within a specified range. Depending on the reference source, the optimum hydroperiod for CSSS habitat falls within a range of 120 – 210 days. [Figure 27](#) shows the changes in the hydroperiod at the four locations for the wet year. Under the Alt7R condition, the four locations shown are either too dry or in the lower end of the range. Under the 8.5SMA WCP simulation, the hydroperiod at the two sites in U5 increase above the range during the wet year. This indicates that there may be potential benefits in habitat U5 since an increase in hydroperiod may result in an increase in the type of vegetation that the CSSS prefers. The locations in U2 show a slight decrease in hydroperiod.

Stages in the 8.5SMA Stormwater Treatment Area

[Figure 28](#) shows the location of six points within the 8.5SMA Stormwater Treatment Area (STA). Stage and ground elevation data were extracted for each point and for the average, dry and wet year simulations. The ranges of stage and ground elevations for each are shown in [figures 29 – 31](#).

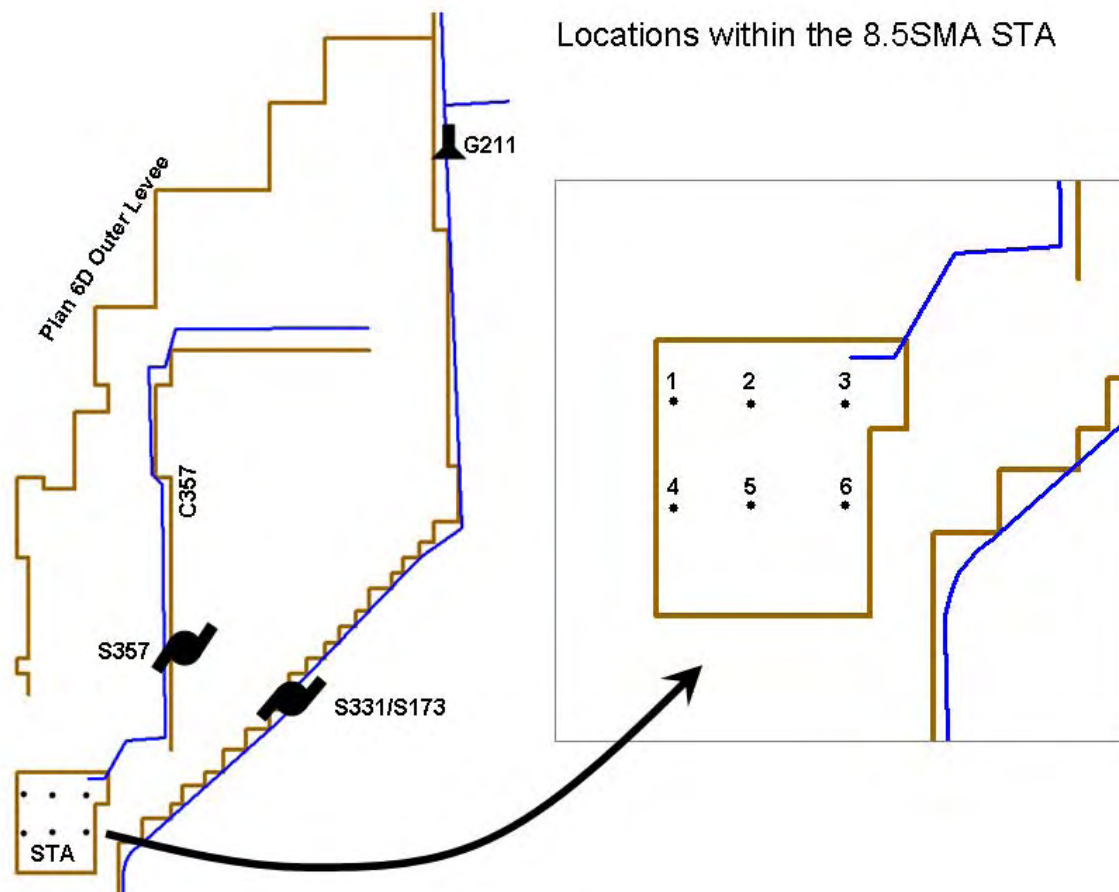


Figure 28: Locations within the 8.5SMA Storm Treatment Area

The most significant change is for the wet year, 1995. During this year, trigger stage causes the S357 structure to operate 362 days out of 365. During the average year (1978), S357 operates only 6 days; S357 rarely operates during the dry (1989) year. As specified in the original 8.5 SMA STA design, the STA will not overflow when depths remain below 3.5 feet; STA overflow does not occur under either of the scenarios simulated for this project.

Figure 31 shows that the water is above ground during the 1995 simulated year between 146 and 183 days. It appears that the time period with water levels above ground could easily exceed 183 days; the model simulation ends with the average stage still well above ground elevations (figure 31). The average (1978) and dry (1989) years show no inundation at all. If we assumed that each simulation represented 1/3 of the “average”, we could state that 2/3 of the time the STA will not have any water in it. However, this would be a unreasonable assumption and statistically unreliable. If we assume that the average year represents the statistical “mean” conditions (a more reasonable assumption), we can state that at least 50% of the time the STA will be dry.

If one were to go further and make the assumptions that (a) hydroperiod is normally distributed and (b) that the 1978 year represents the mean year and the 1995 year the mean + 1 standard deviation, one might infer that 84% of the time the STA will be dry. This would also be a unreasonable assumption. The primary problem with the assumption is the STA is being managed and would not be expected to have any kind of a normal distribution of hydroperiods.

However, it is probably a safe bet that the STA will be dry at least 50% of the time. And if one looks at how dry it actually is during the average year ([figure 29](#)), one sees that the stage is between approximately 1.5 - 2 feet below ground, which indicates that most years with above average rainfall will still be dry within the STA.

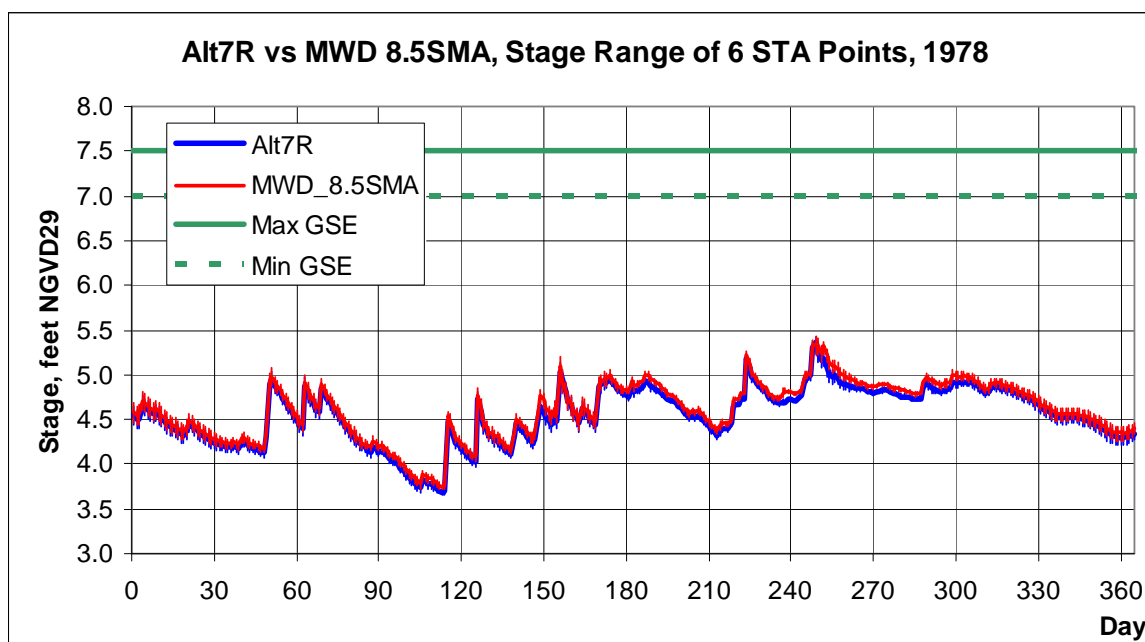


Figure 29: Range of Stage and Ground Elevation at 6 STA Points, 1978

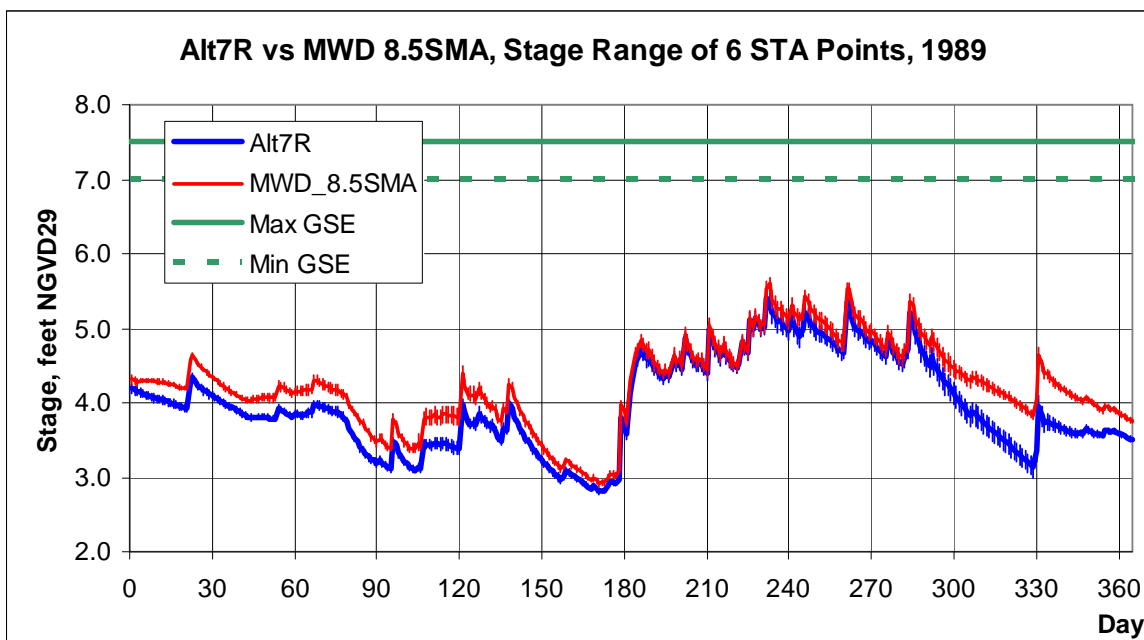


Figure 30: Range of Stage and Ground Elevation at 6 STA Points, 1989

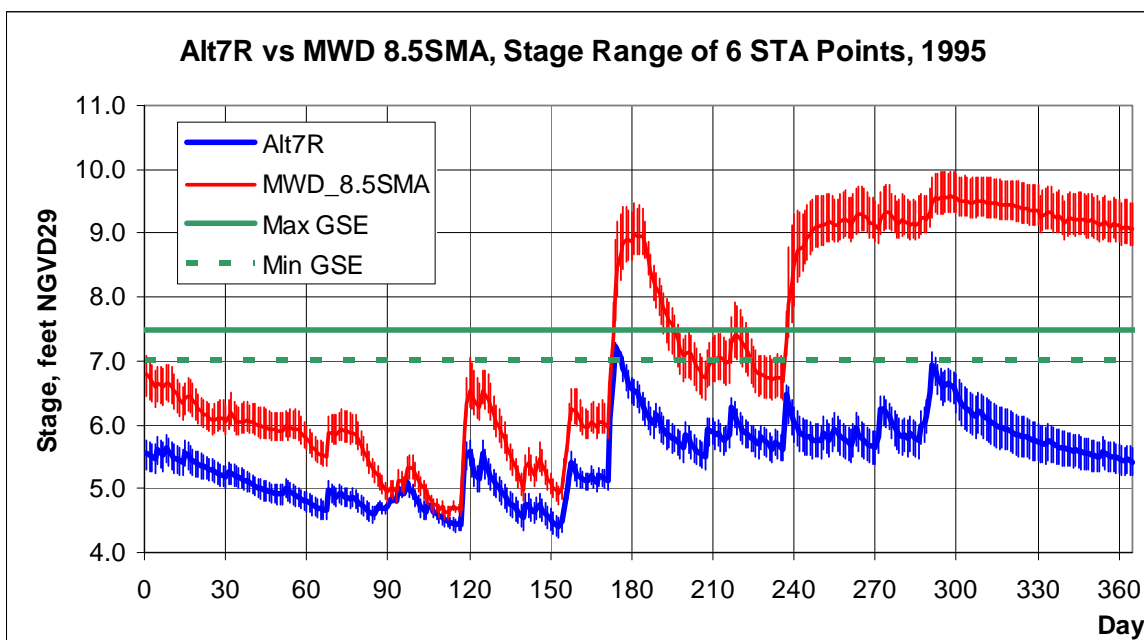


Figure 31: Range of Stage and Ground Elevation at 6 STA Points, 1995

The simulated impact of the 8.5SMA WCP on other structures is illustrated in [figures 32 – 34](#), which show the total yearly volume of water passing through specified structures for each of the years simulated (wet, dry, and average years). Perhaps the most significant effect is the decrease in pumping at S331 under the 8.5 SMA WCP condition in 1995. S331 pumps approximately 674,000 ac-ft under the Alt7R condition, versus approximately 92,000 ac-ft

under the 8.5SMA WCP condition. This is a reduction of approximately 86%. The pumping volume of S357 under the 8.5SMA WCP is approximately 238,000 ac-ft. The total of S331 and S357 under the 8.5SMA WCP is approximately 330,000 ac-ft, which is still a 51% reduction in required pumping from the Alt7R condition. Daily average pumping rates for S331 and S357 are shown in figure 35.

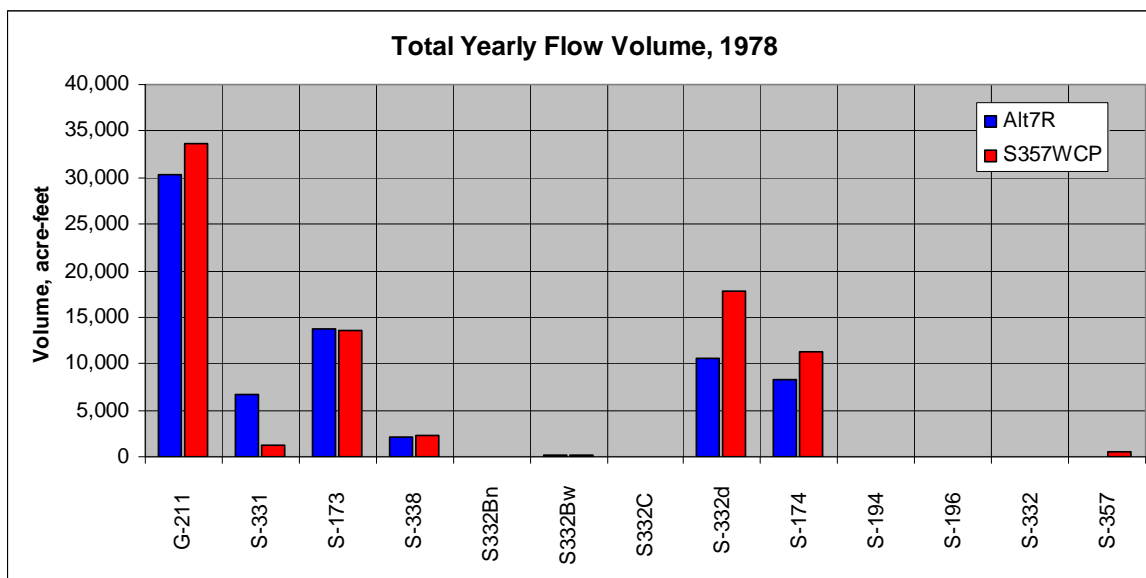


Figure 32: Yearly Flow Volumes through Structures, 1978

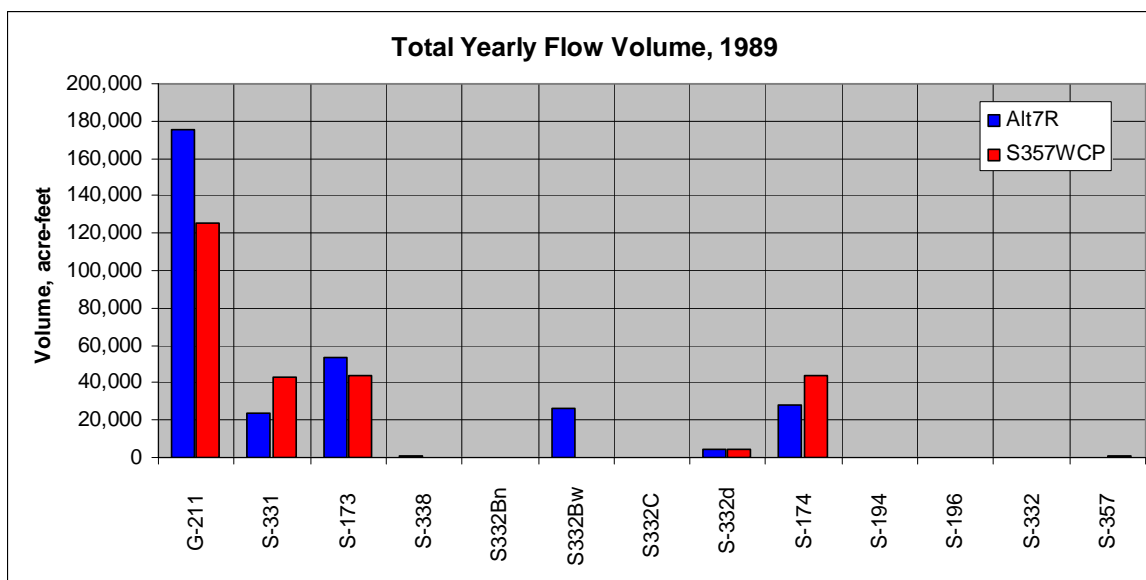


Figure 33: Yearly Flow Volumes through Structures, 1989

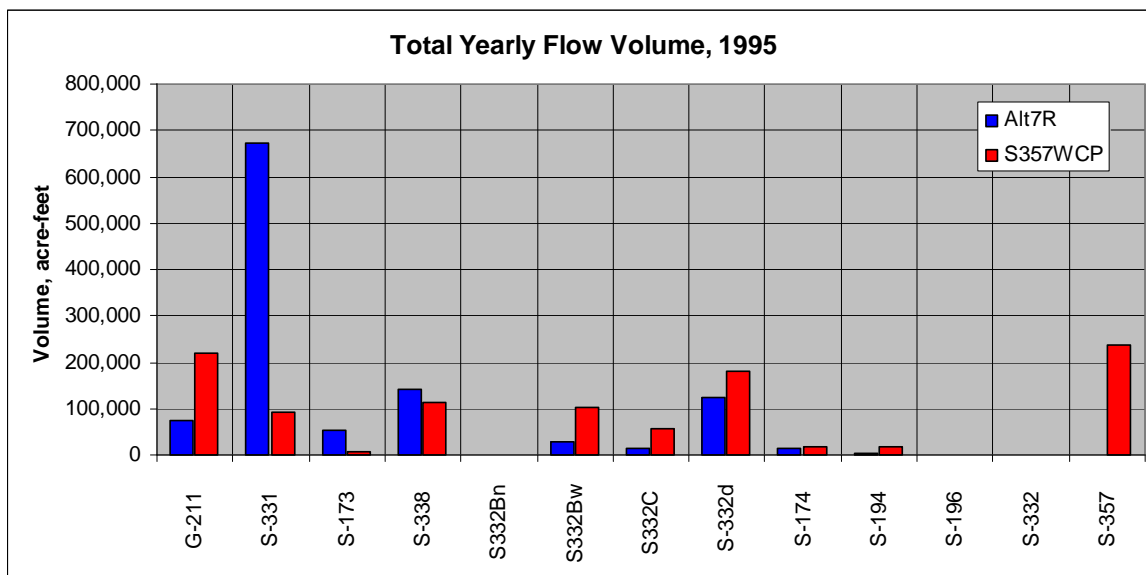


Figure 34: Yearly Flow Volumes through Structures, 1995

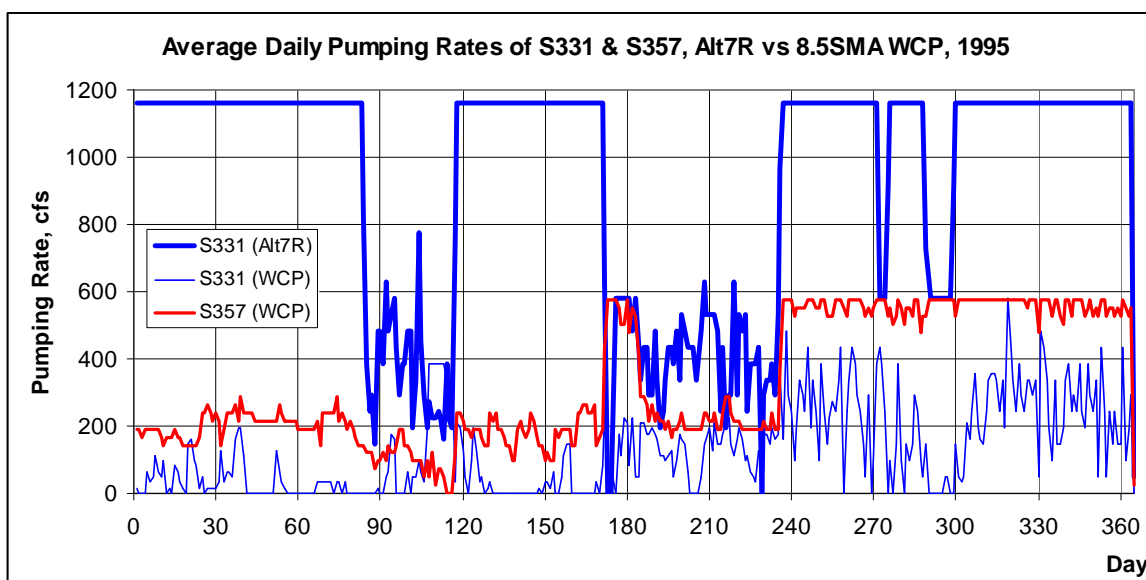


Figure 35: Pumping Rates of S331 and S357, 1995

MB_2006 link to 2000 8.5SMA GRR

The 2000 8.5SMA GRR used a group of MODBRANCH computation cells as point sources for illustrating results. Figure 36 shows the “indicator” cells used in that report.

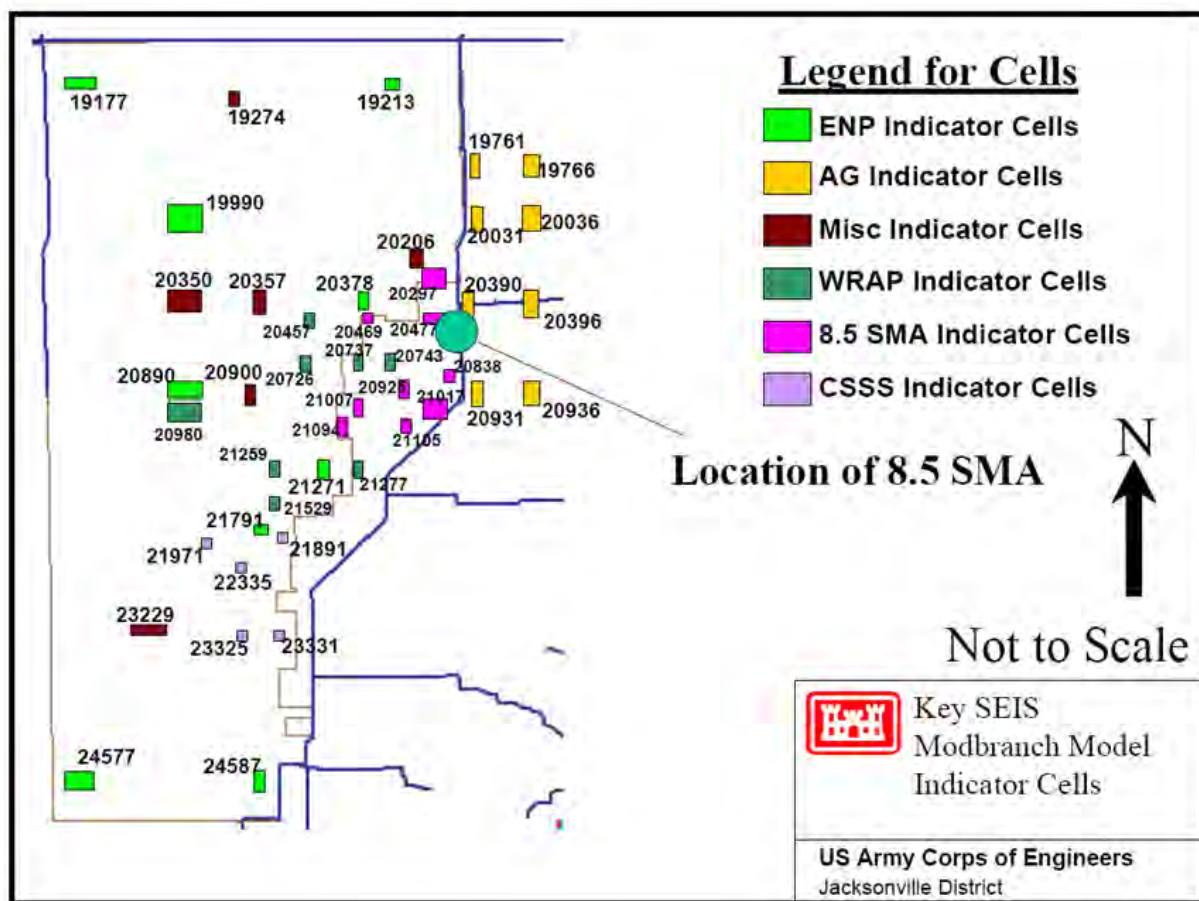


Figure 36: Indicator Cell Locations from 2000 8.5SMA Study

Out of these 40+ indicator cells, 26 have been chosen for presentation in this report. There are 8 agricultural cells, 9 8.5SMA cells, and 9 ENP cells.

The “AG” cells are: 19761, 19766, 2003, 20036, 20390, 20396, 20931, and 20936; the 8.5 SMA cells are: 20297, 20477, 20469, 20838, 20925, 21007, 21017, 21094, and 21105; and the ENP cells are: 19177, 19213, 19990, 20378, 20890, 21271, 21791, 24577, and 24587.

Figures 37 – 39 show the average stage differences (8.5SMA WCP simulated stages minus Alt7R simulated stages) for the average, dry, and wet years separated into the three groups. Positive differences indicate that the 8.5SMA WCP simulated stages are higher than the Alt7R simulated stages; negative

differences indicate that the simulated 8.5SMA WCP stages are less than the simulated Alt7R stages.

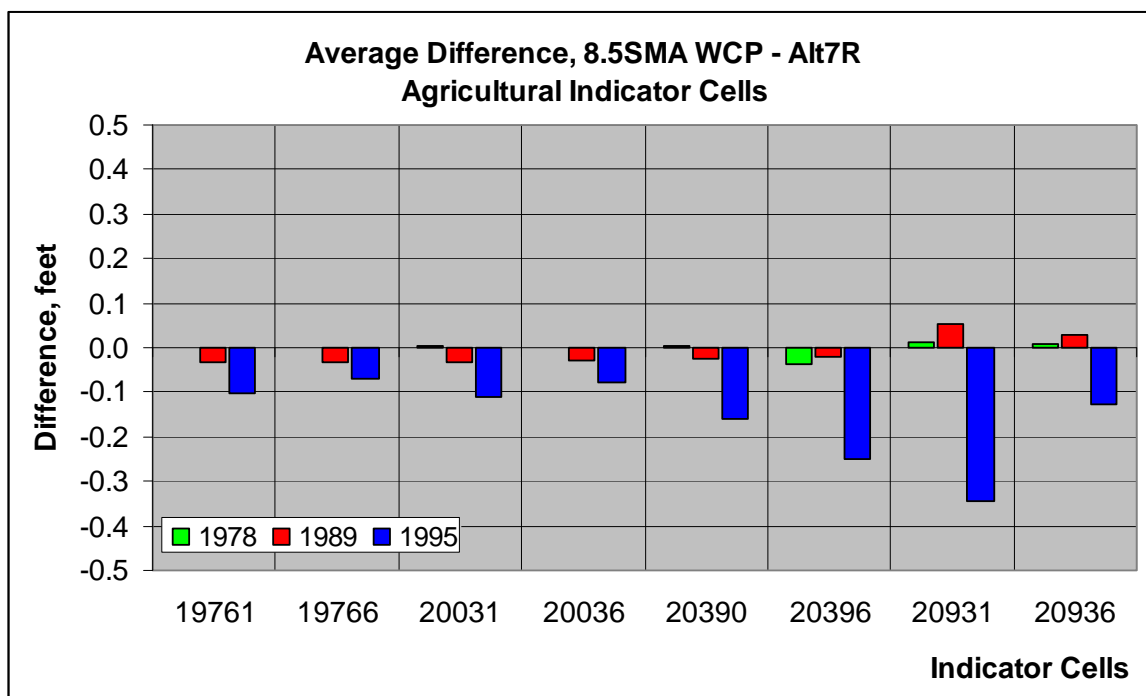


Figure 37: Average Difference, 8.5SMA WCP - Alt7R, Agricultural Indicator Cells

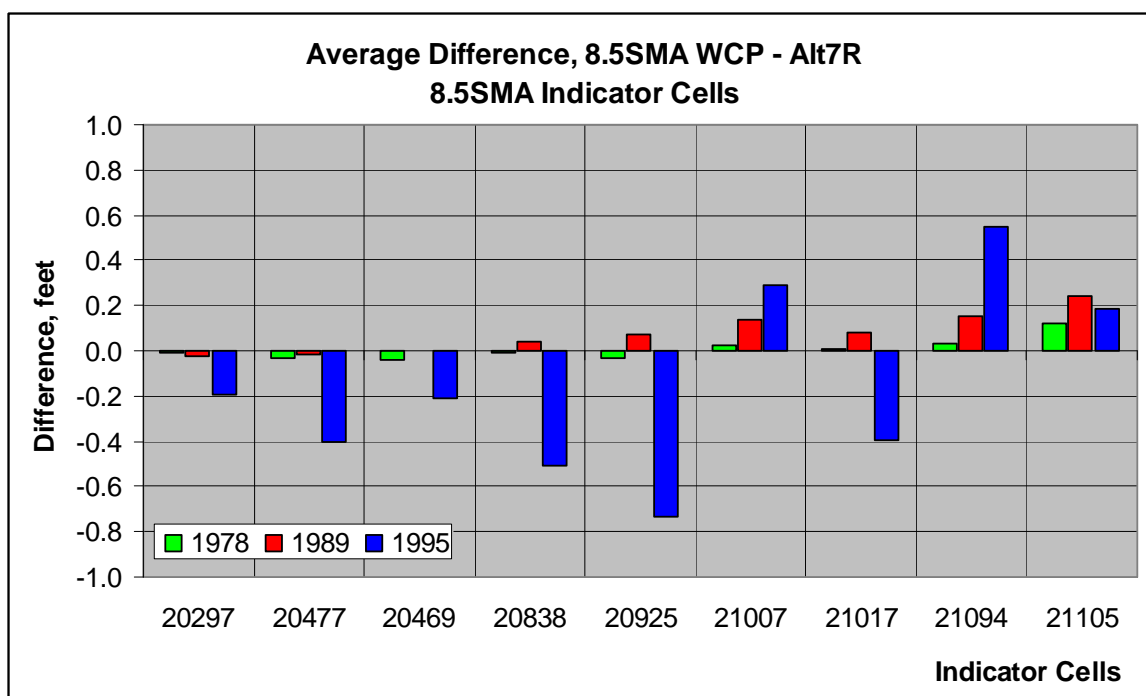


Figure 38: Average Difference, 8.5SMA WCP - Alt7R, 8.5SMA Indicator Cells

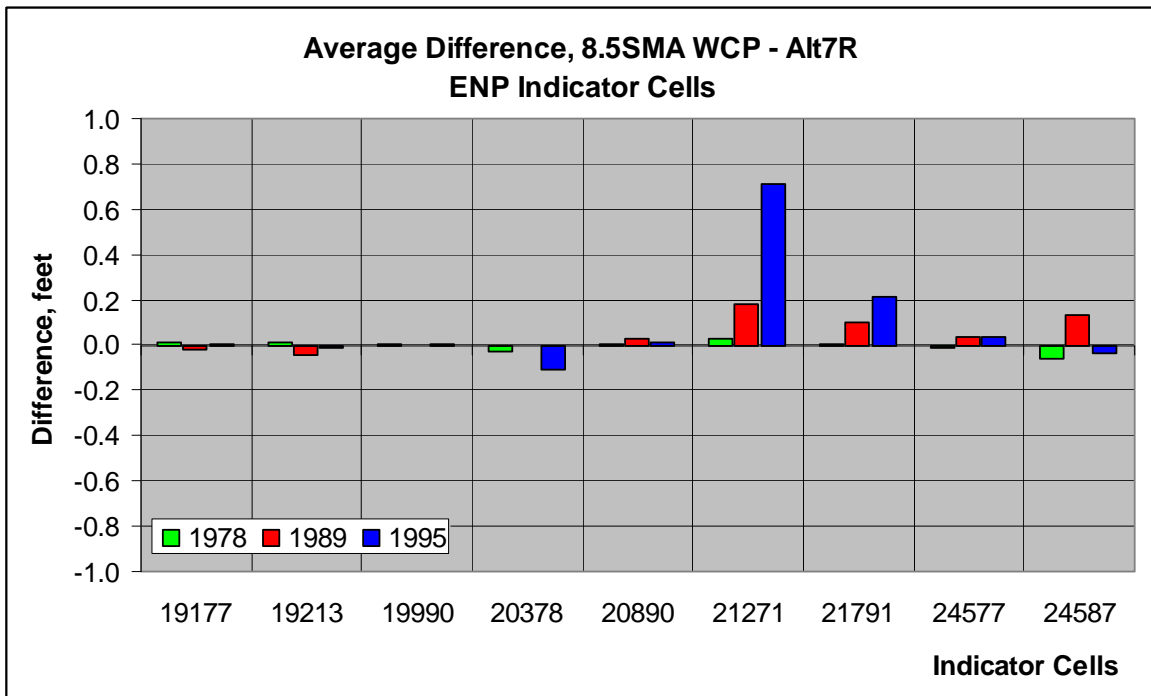


Figure 39: Average Difference, 8.5SMA WCP - Alt7R, ENP Indicator Cells

In the AG group, the dry and average years show an absolute average difference less than 0.1 foot. This can safely be considered insignificant. The wet year indicates that the 8.5SMA WCP simulated stages are generally lower, although less than 0.5 foot. These results indicate no significant impact would be expected in the agricultural areas.

The 8.5SMA group has only a single indicator cell with a significant increase. Indicator cell 21094 shows an average increase of about 0.5 foot. The other cells in the 8.5SMA show either a decrease or an insignificant increase. Cell 21094 is located in the extreme southwestern portion of the 8.5SMA.

The ENP group shows only a single cell with a difference greater than 0.5 foot. Indicator cell 21271 is located just to the west of the 8.5SMA STA.

Summary

The 8.5SMA proposed operating criteria, as proposed, are able to maintain the present level of service for the areas within the 8.5SMA. In addition, model results indicate that there will be no significant increase in flooding in areas to the east, outside of the 8.5 SMA.

Model results also indicate that in dry and average years, no significant adverse environmental impacts would be expected. There may be impacts to the CSSS habitats U2 and U5. The impacts should tend to be beneficial to U5, while the impacts to U2 may be marginally detrimental.

The MODBRANCH simulation results presented here represent a concise review of the difference between the proposed 8.5SMA WCP and the existing Alt7R condition. Results in the field need to be monitored with the potential for re-evaluating the proposed operating criteria.

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APPENDIX E
PROJECT FEATURES

E.1 Levees and Canals

There are three levees associated with this project: perimeter levee (L-357W), seepage canal levees (L-357) and the STA and flow way levees (L-359). All levees are designed to mitigate for the increased flood risk as a result of the MWD project implementation.

- L-357W is the perimeter levee whose purpose is to protect the remainder of the 8.5 SMA from increased stages within Everglades National Park.
- The L-357 levee is the levee embankment that runs parallel on both sides of the C-357 seepage canal. L-357 will prevent surface water runoff from directly entering the seepage canal.
- L-359 is the perimeter levee embankment surrounding the STA and along the flow way.

Refer to the main body of the EA, **Figure 1-2: Project Features Map**, for location of levees and canals in the project area.

There is one canal associated with this project: the C-357 seepage canal. The seepage canal intercepts seepage coming from the west due to higher stages in Everglades National Park. The seepage canal has a 14 ft depth and varies in bottom width from 25 ft to 30 ft. Along the canal are 5 culverts to allow water to flow at road crossings.

E.2 Inflow and Outflow Structures

- Pump Station 357 (S-357) is located at the southern end of the C-357 canal approximately 4,000 ft west of L-31N along Richmond Drive and south of the S-358E culvert. The design capacity of this pump station is 575 cfs which is achieved through the operation of 5 pumps: 4-125 cfs diesel pumps and 1-75 cfs electric pump. The pump station will move water from the C-357 seepage canal into the flow way which leads into the STA via the S-359 weir structure.
- Structure 358A (S-358A) is located at the crossing of the C-357 canal and 197th Avenue. S-358A is a double barrel 10-ft diameter Corrugated Aluminum Pipe (CAP) culvert 135 ft in length that will move water under 197th Avenue.
- Structure 358B (S-358B) is located at the crossing of the C-357 canal and 199th Avenue. S-358B is a double barrel 10-ft diameter CAP culvert 135 ft in length that will move water under 199th Avenue.

- Structure 358C (S-358C) is located at the crossing of the C-357 canal and 136th Street (Howard Drive). S-358C is a double barrel 10-ft diameter CAP culvert 149 ft in length that will move water under 136th Street.
- Structure 358D (S-358D) is located at the crossing of the C-357 canal and 152nd Street. S-358D is a double barrel 12-ft diameter CAP culvert 149 ft in length that will move water under 152nd Street.
- Structure 358E (S-358E) is located at the crossing of the C-357 canal and 168th Street. S-358E is a double barrel 12-ft diameter CAP culvert 149 ft in length that will move water under 169th Street.
- Structure 359 (S-359) is a passive broad-crested 400 ft long overflow weir located 2,000 ft south of 168th Street (Richmond Drive) at the southern end of the flow way. The function of the S-359 weir is to pass the S-357 pump station peak discharge with approximately 0.75 ft head into the STA. This structure will hold a 2.5 ft of water in the flow way to prevent erosion along the levees.
- Structures 360W and 360E (S-360W and S-360E) are both passive broad-crested 350 ft long overflow weirs located along the southern most part of the STA. These weirs function to control the discharge of water from the STA. Discharges from these weirs will not occur until the C-111 NDA is constructed and operational.

Table E-1 below summarizes all of the project features and their function as relevant to project operations.

Table E-1: Summary of Project Features

NAME	TYPE	FUNCTION and/or DESCRIPTION
Embankments		
L-357	Levee Embankment	Levee Embankments on both sides Seepage Control Canal S-357
L-357W	Perimeter Levee STA and Flow	Outside Boundary Perimeter Levee for 8.5 Square Mile Area
L-359	way Embankment	STA and Flow way Perimeter Levee Embankments
Canals		
C-357	Seepage Control Canal	Seepage Control Canal Pumped by S-357 Pump Station
Structures		
S-357	Pump Station	Pump Station south of 168th Street Culverts
S-358A	Culvert	Culvert @ 197TH AVE
S-358B	Culvert	Culvert @ 199TH AVE
S-358C	Culverts	Culverts @ 136TH ST (Howard Drive)
S-358D	Culverts	Culverts @ 152ND ST
S-358E	Culverts	Culverts @ 168TH ST (Richmond Drive)
S-359	Weir	STA Inflow Weir to 8.5 SQ MILE
S-360W	Weir	STA West Outflow Weir to 8.5 SQ MILE
S-360E	Weir	STA East Outflow Weir to 8.5 SQ MILE

E.3 Seepage Control

Higher levels of seepage east of the L-357W perimeter levee will be anticipated due to the implementation of the MWD project which will create higher stages in Everglades National Park. This seepage will be controlled by the C-357 seepage canal. C-357 canal provides approximately 3.5 miles of conveyance into to the flow way – STA system. The seepage canal is designed to only intercept seepage from groundwater; surface water runoff will not enter the canal directly due to the L-357 levee.

E.4 Access Roads

Access roads are used for construction purposes, access to the pump station and other structures as well as for allowing FP&L access to maintain their power lines. All of the final access roads are located at the culvert crossings along the C-357 seepage canal and will consist of asphalt material. The final access roads at the culvert crossings will remain open for residential traffic; these include: SW 197th Avenue, SW 199th Avenue, SW 136th Street (Howard Drive), SW 152nd Street and SW 168th Street (Richmond Drive).

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